PRELIMINARY DRAINAGE REPORT

STORYROCK PHASE 3

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INTRODUCTION

PROJECT DESCRIPTION

This Preliminary Drainage report has been prepared for the proposed Storyrock Phase 3 residential development. StoryRock Phase 3 (Phase 3) is part of the StoryRock Master Planned Community (formerly named Cavalliere Ranch); a development consisting of 462-acres of single family residential construction. A Conceptual Master Drainage report was approved October 2014 with the project Zoning Case (13-ZN-2014).

StoryRock Phase 3 is a proposed 94-acre single family residential subdivision consisting of 78 single family residential units. Phase 3 is zoned for R1-18, R1-35, and R1-43 development. All R1-18 areas are proposed to be mass-graded and R1-35, R1-43, and R1-70 areas will require separate single lot grading plans for each lot developed. The proposed site is located within the City of Scottsdale and falls under the City's Environmentally Sensitive Lands Ordinance (ESLO).

PROJECT LOCATION AND DESCRIPTION

StoryRock is located within Section 12 of Township 4 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is bound to the north by the Happy Valley Road Alignment and to the west by 128th Street. The Pinnacle Peak Road Alignment borders the site to the south. The McDowell Sonoran Preserve borders the site to the east and portions of the site to the north and south. Phase 3 is located on the southernmost portion of the site, north of Pinnacle Peak Road Alignment. (See **Figure 1: Location Map**).

The development is located within one flood zone as shown on Flood Insurance Rate Map (FIRM) panel number 04013C1335L, dated October 16, 2013 (see **Appendix A** for FIRM). The flood zones that pertain to the site are as follows:

"Other Areas" Zone D – "Areas in which flood hazards are undetermined, but possible"

The property is undeveloped natural desert, characterized by braided washes and rock features of varying sizes. Undeveloped desert is also characterized by native desert grasses and brush.

SCOPE OF DRAINAGE REPORT

The approved master drainage report and associated zoning material established the general drainage parameter and criteria for site planning. This report for Phase 3 further establishes drainage parameters and criteria for preliminary design. This report establishes a hydrologic plan for the development of the site as well as preliminary hydraulic analysis for the washes crossing the site.

All drainage criteria presented in this report will conform to the City of Scottsdale Design Standards & Polices Manual (DS&PM).

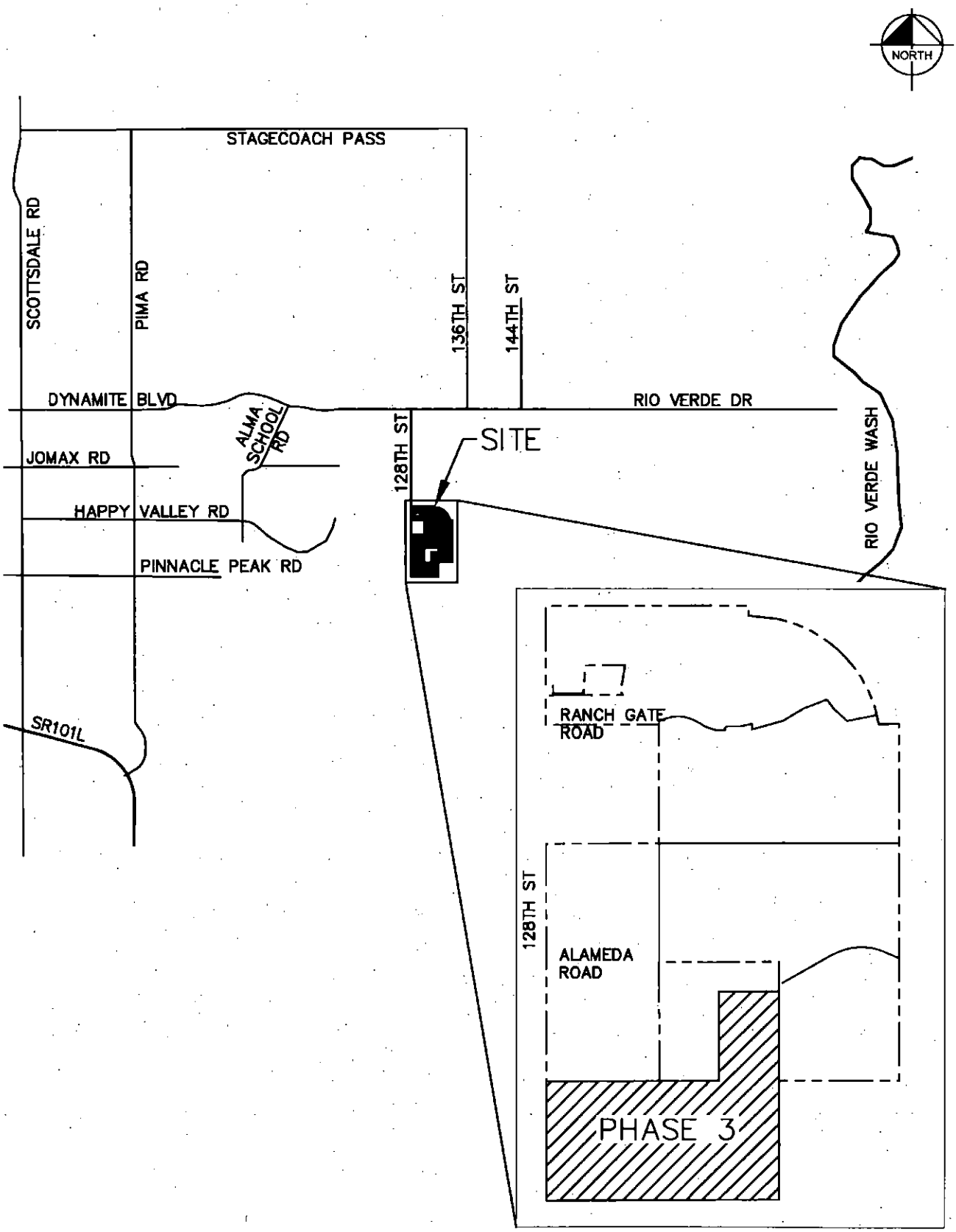

FIGURE 1
VICINITY MAP
STORYROCK

Kimley»Horn

DESCRIPTION OF EXISTING DRAINAGE CONDITIONS AND CHARACTERISTICS

EXISTING SITE CONDITIONS

The site is characterized by many washes and rock features of varying sizes. The on-site washes vary in size and depth, but generally flow from the southwest to northeast or east through the site. Phase 3 is located in the southern portion of the Storyrock development. Phase 3 is bound by other phases of Storyrock to the north and northeast, as well as an undeveloped residential property, and the Sonoran Preserve to the south and southeast. Storm water runoff impacts Phase 3 from the west and south, and is conveyed through the site in existing washes. Runoff is discharged into adjacent Storyrock Phases to the north and east, and into the Sonoran Preserve to the southeast. Multiple ridgelines run though the site, in the general direction of southwest to northeast.

The site falls within the City of Scottsdale Environmentally Sensitive Lands (ESL) and is subject to the design criteria of the Environmentally Sensitive Lands Ordinance (ELSO). Specifically, the site is categorized as Upper Desert Landform of ESL. Per the DS&PM "The ordinance requires that a percentage of each property be permanently preserved as natural area open space (NAOS) and the specific environmental features, including vegetation, washes, mountain ridges and peaks be protected for inappropriate development".

EXISTING OFF-SITE DRAINAGE CONDITIONS

Off-site flows impact the site from the south, and west. Off-site flows originate from large undeveloped sub-basins. The basins to the south are part of the McDowell Sonoran Preserve. The areas to the west of 128th Street are mostly undeveloped residential properties. Refer to **Figure 2: Offsite Drainage Map.** In a few locations, washes exit the site to the north, before re-entering the northeast portion of Phase 3. Refer to the **Figure 3: Existing Drainage Condition.**

Off-site flows vary from local low flows up to large wash flows over 300 cfs. Most off-site flows will be conveyed through the site by the existing washes. 128th Street from Ranch Gate Road south to the Tom's Thumb trailhead consists of a two-lane paved road with several at-grade drainage crossings. A few locations provide low flow pipe culvert crossings that are undersized to accommodate larger storm events from overtopping the roadway section. No curb exists along the roadway and runoff generated along 128th Street sheet flows in the eastwardly direction through the StoryRock development.

An existing conditions hydrologic model was completed to develop peak discharges for the offsite runoff contributing to the Site. Offsite sub-basins were delineated based on the City of Scottsdale Quarter Section Topography. Significant washes are defined as having a 100-year flow of 50 cfs or more. There are no washes with 100-year peak flows of 750 cfs or greater, which indicates that no Vista Corridors exist within the project area. Significant washes been identified on **Figure 3: Existing Drainage Condition.** Hydrologic results can be found in **Appendix B**.

EXISTING ON-SITE DRAINAGE CONDITIONS

Five significant offsite washes cross Phase 3 and have been identified **Figure 3: Existing Drainage Condition.**

An existing conditions hydrologic model was completed to determine the peak stormwater discharges leaving the site. The existing condition discharges will be compared to the proposed condition discharges in a "pre-vs-post" analysis. The proposed condition discharges must be equal to or below the existing condition.

An existing conditions hydraulic model was completed for the five significant washes crossing the site. The existing conditions hydraulic analysis was used as the basis for a post-conditions analysis. Hydraulic analysis has been performed on the significant washes to determine the 100-year Base Flood Elevations (BFEs) at specific cross sections. These elevations are used to map the existing 100 year limits of inundation.

Hydrology and hydraulic results can be found in **Appendix B** and **Appendix C** respectively.

PROPOSED PRELIMINARY DRAINAGE PLAN

PROPOSED ON-SITE DRAINAGE PLAN

The proposed Phase 3 development consists of 78 single family residential units. Lots located along the washes will have finished floor elevations a minimum of one foot above the 100-year base flood elevation (BFE). In general, lots will drain to the street system and runoff will be conveyed in the streets and/or in on-site swales and storm drain systems to detention basins or wash crossing locations located throughout the project. Due to the steep and undulating terrain, some lots will require rear or side yard drainage into adjacent washes or drainage swales within the development in order to minimize impacts to environmental features, existing natural area open space, and meet design criteria as required with the Environmentally Sensitive Lands Ordinance for the project. Specific lots that drain via rear or side yard locations within the project have been identified on **Figure 4** and on the preliminary grading and drainage plan in **Appendix E**. Detention basins will detain runoff before discharging into the existing washes and will be sized to meet first flush criteria. Specific areas that discharge into existing washes and are not routed through drainage basins will provide for alternative methods to meet first flush criteria. A further discussion regarding alternative methods to first flush is provided in the "Stormwater Storage Method" section below. The post development flows exiting the site will be attenuated though detention basins to a level equal to or less than pre-development flows. See **Figure 4: Proposed Conditions Drainage Map.**

Lots that are zoned R1-18 will be mass graded with the roadway improvements as part of this project. All other lots zoned as R1-35, and R1-43 will require single lot grading plans in the future for separate review and permit. The roadways and drainage facilities will be graded as part of this project to account for existing undisturbed areas located within future lot locations. Limits of grading have been shown on the preliminary grading and drainage plan in **Appendix E**.

PROPOSED OFF-SITE DRAINAGE PLAN

Offsite flows impact the site from the south, and west. Flows will be conveyed through the site and will discharge at their historic locations on the east and north side of the Site.

Associated with the development of Storyrock, 128th Street roadway infrastructure will be constructed. These roadway improvements will be completed under a separate plan from the on-site improvements, and will include final drainage reports, however, the run-off from the off-site roadway is included within the on-site drainage plans.

128th Street consists of a median divided roadway with curb, and will include multiple culvert crossings to convey flow under the proposed roadway. In the existing condition, 128th Street roadway flows sheet flow to the east. The proposed 128th Street roadway design consolidates the roadway discharges locations to major wash crossings.

Any increased run-off created by the 128th Street roadway improvements. from either the increased imperious area or changes to the drainage patterns are accounted for with the Phase 1A and Phase 2 drainage plans.

In most cases, off-site flows are conveyed within the existing washes. A wash modification is required in two locations to re-route the wash through the proposed development. Wash335 is routed through a storm drain network and through DB336. This area in particular contains three significant washes in close proximity. The configuration proposed is limited to this location only on Phase 3 and reduces the overall impacts to existing washes/natural area open space throughout the development. It is understood that the City does not prefer routing offsite flows through a detention basin. All design considerations were taken to limit this condition to this single location within the development. It is recommended that provisions for sediment build-up are implemented prior to the storm drain outlet at DB336. Wash340 will also be routed through a storm drain network. This is necessary to route the flow around DB340 and minimize impact to NAOS. Of the approximate 8,500 feet of significant washes within Phase 3, it is proposed to modify less than 1,000 feet. For extents of the wash modifications see **Figure 4: Proposed Conditions Drainage Map.**

PROPOSED ON-SITE HYDROLOGY

On-site runoff from the proposed development maintains post-development flows at or below pre-development conditions at each of the Phase 3 exit points, for the three design storms (2-year, 10-year, and 100-year). Except for five locations, CP13, CP 21, CP24, CP25 and CP 34, in which the post development flow exceeds the existing condition flow by approximately 1-2 cfs. At an additional five locations, CP 14, CP16, CP20, CP27 and CP29, only the 2-year post development flow exceeds the existing condition flow, by approximately 1-2 cfs. This is within the level of accuracy of the analysis, and should be considered incidental and in conformance with the design. Furthermore, the downstream condition is undeveloped McDowell Sonoran Preserve and the minor increase does not negatively impact any downstream properties. For a summary of pre- and post-development peak discharges is provided in **Table 1.** Multiple detention basins are used to attenuate peak discharge from on-site runoff. A basin summary table has been provided in **Appendix B** indicating basin volumes, maximum depths, orifice sizes, side slopes, peak inflow and outflow rates, drain times, and storage volumes provided for the 2, 10, and 100 year events. Each basin utilizes a bleed-off pipe with orifice plate with the intent to control post-development runoff exiting the development, with a spillway for larger storm events. In some basins, the bleed of pipe is set above the bottom of the basin to help attenuate the smaller storm events. The runoff in the basin which is not discharged by positive outfall will percolate from the bottom of the basin. In no case is the more than 0.5 feet of depth required to percolate. The total drain time for all basins is less than 36 hours. Detention Basin 225 (DB225) is located within Storyrock Phase 2. If DB225 is not constructed prior to development of Phase 3, it must be constructed with Phase 3. For in-line basins, the potential for culvert sedimentation build-up is increased. Sedimentation deposit within the culvert should be minimized, however, due to the high flow velocities within the culvert. Additionally, a culvert maintenance program is proposed with the development (see additional information in the "Culvert Sedimentation" section below). Refer to **Appendix B** for the detailed hydrologic model results.

Table 1: Peak Discharge Summary

Concentration Point	Prop. Cond. 2-Year (cfs)	Ex. Cond. 2-Year (cfs)	Prop. Cond. 10-Year (cfs)	Ex. Cond. 10-Year (cfs)	Prop. Cond. 100-Year (cfs)	Ex. Cond. 100-Year (cfs)
CP1	3	3	8	8	17	17
CP2	16	16	47	47	121	121
CP3	18	18	52	52	132	132
CP4	6	6	17	17	39	39
CP5	8	8	23	23	61	61
CP6	1	1	4	4	9	9

Concentration Point	Prop. Cond. 2-Year (cfs)	Ex. Cond. 2-Year (cfs)	Prop. Cond. 10-Year (cfs)	Ex. Cond. 10-Year (cfs)	Prop. Cond. 100-Year (cfs)	Ex. Cond. 100-Year (cfs)
CP7	1	1	4	4	8	8
CP8	8	8	24	24	57	57
CP9	1	1	3	3	8	8
CP10	6	6	16	16	42	42
CP11	1	1	4	4	8	8
CP12	4	4	11	11	22	24
CP13	4	2	7	6	14	12
CP14	37	36	108	108	270	270
CP15	0	0	1	1	2	2
CP16	5	4	11	11	22	27
CP17	0	0	1	1	2	2
CP18	33	33	97	97	243	245
CP19	1	1	1	3	3	6
CP20	43	42	121	123	304	315
CP21	1	1	4	3	8	7
CP22	34	34	99	100	248	251
CP23	1	1	2	2	3	4
CP24	1	1	2	2	7	5
CP25	1	1	2	1	3	3
CP26	43	43	123	126	316	328
CP27	4	3	7	9	20	22
CP28	0	1	1	2	2	5
CP29	22	20	58	60	149	156
CP30	1	1	2	3	3	6
CP31	10	11	28	33	75	80
CP32	8	8	22	23	54	59
CP33	2	2	5	6	11	13
CP34	1	0	1	1	3	2

PROPOSED ON-SITE HYDRAULICS

On-site runoff will be conveyed in the local streets, swales, storm drains, and culverts to the detention basins or wash discharge locations. Per the DS&PM all interior streets will be designed to convey the peak discharge from the 10-year storm event at or below the top of curb elevation. Additionally, the streets will convey the 100-year runoff within the proposed tracts and maintain a maximum flow depth of eight inches above the gutter flow line. Catch basins with storm drains or scuppers will capture pavement runoff and outfall to the proposed detention basins. In specific roadway discharge locations areas where detention basins are not provided, alternative methods such as stormceptor structures will be provided to meet first flush criteria (see additional information in the "Stormwater Storage Method" section below). The scupper, catch basins and storm drains will be designed per the DS&PM and FCDMC's Drainage Policies and Standards. Detailed catch basin and street capacity analysis will be completed as part of the final design.

The existing hydraulic model was revised for a proposed hydraulic model to determine the proposed condition 100-year BFE and limits of inundation. Development of the site, including roadway, culverts and lots encroach into the existing BFE. The proposed hydraulic model includes these encroachments and modifications to calculate the proposed BFEs and proposed 100-year limits of inundations. The proposed BFEs at the boundary of the site, both upstream and downstream cannot be higher than the existing condition. **Table 2** provides a summary of the existing and proposed 100-year BFE at the boundary conditions of the site. Refer to **Appendix C** for a complete HEC-RAS summary table.

Table 2: Boundary Base Flood Elevation Summary

Wash	HEC-RAS Cross Sections	Ex. Cond BFE	Prop. Cond BFE	Note:
Wash 215	2467	2636.25	2636.27	Site Entrance
Wash 215	2222	2627.76	2627.81	Site Exit
Wash 303	549	2745.52	2745.89	Site Entrance
Wash 304	850	2760.80	2760.81	Site Entrance
Wash 305	1881	2690.86	2690.90	Site Exit
Wash 305	784	2643.89	2643.98	Site Entrance
Wash 305	109	2615.49	2615.45	Site Exit
Wash 310	2892	2751.83	2751.97	Site Entrance
Wash 310	170	2635.79	2635.78	Site Exit
Wash 335	1767	2719.13	2719.08	Site Entrance
Wash 335	186	2649.33	2649.33	Site Exit
Wash 340	134	2653.86	2653.80	Site Exit

Roadway culvert crossings of significant washes were designed. The proposed culverts are designed to pass at least the 10-year flow without overtopping. The culverts will pass the 100-year flow with a maximum overtopping of 12-inches. Culverts will include design measures to protect the roadway from erosion during overtopping events. All lots and structures will be accessible by at least one route with a depth of flow no greater than 1 foot during the 100-year event. The proposed culverts are included in the hydraulic analysis, Refer to **Appendix C** for hydraulic results.

Minor flows less than 50 cfs impact lots, driveways, and roadways within the development. These flows will be routed around the lots in swales, and under driveways and roadways in culverts. The flows will discharge at their historic location onsite. The swales will be designed to be natural in appearance and match the existing topography of the site. For areas that will require future R1-35, R1,43, and R1-70 single lot grading plans, flows will be routed around and match existing drainage discharge locations. A typical lot grading detail has been provided on the preliminary grading and drainage plan in **Appendix E** for reference.

Per section 4-1.407 of the DS&PM development within ESL should minimize the modification of significant washes and maintain these washes in their native locations and conditions. All significant washes within Phase 3 are maintained in their existing corridors. See **Appendix E** for a copy of the preliminary grading plan. The preliminary grading plan shows the HEC-RAS cross sections and BFEs for the proposed conditions. The plan also includes information on the proposed detentions basins, fished floor elevations and culvert sizes.

LOWEST FINISH FLOORS

The finished floor elevations for each lot will have a minimum elevation of one foot above the 100-year base flood elevation (BFE). See **Appendix C** for complete hydraulic results and **Appendix E** for a copy of the preliminary grading plan with BFEs and pad elevations.

SPECIAL CONDITIONS

404 PERMIT/JURISDICTIONAL WASHES

Kimley-Horn has submitted and received approval of Jurisdictional Delineation (JD) for the entire Storyrock development from U.S. Army Corps of Engineers (Corp). Kimley-Horn will also prepare and process an Individual Permit for proposed disturbances.

EROSION SETBACK ANALYSIS

A Level I erosion setback analysis was performed on the significant washes on the site. The analysis followed the requirement in the Arizona Department of Water Resources (ADWR) Sate Standard Attachment 5-96. Locations along the washes, where roadways or lot wall encroaches into the erosion setback, a form of erosion protection is required. A summary of the erosion setbacks for the significant washes is provided in **Table 3**. The erosion hazard setback and preliminary erosion protection shown on the preliminary grading plan, see **Appendix E**, for reference. The erosion cutoff walls or other form of erosion protection will be designed during the final design.

Setback = Sqrt(Q100) for straight wash sections, with a minimum setback of 20'

Setback = 2.5*Sqrt(Q100) for curved wash sections, with a minimum setback of 50'

Table 3 Erosion Setback Summary

	Q100 (cfs)	Erosion Hazard Setback, Straight Reach (Calculated)	Erosion Hazard Setback, Straight Reach (Design)	Erosion Hazard Setback, Curved Reach (Calculated)	Erosion Hazard Setback, Curved Reach (Design)
Wash 215	264	16'	20'	41'	50'
Wash 303	121	11'	20'	28'	50'
Wash 304	132	12'	20'	29'	50'
Wash 305	316	18'	20'	45'	50'
Wash 310	149	13'	20'	31'	50'
Wash 335	75	9'	20'	22'	50'
Wash 340	54	8'	20'	19'	50'

ADEQ WATER QUALITY REQUIEMENTS

Development of the project will impact a large enough area to require a submittal of a Notice of Intent (NOI) to the Arizona Department of Environmental Quality (ADEQ). The NOI will be submitted to ADEQ and an approved NOI certificate with an AZCON number will be provided to the city before approval of any improvement plans.

CULVERT SEDIMENTATION

Sedimentation reduces the hydraulic performance of culverts and can lead to safety, erosion, and maintenance issues. The proposed culverts and storm drains within the project have been designed to minimize sedimentation when possible, as well as providing solutions to reduce the impact of

sedimentation. Culverts are designed to match the slope of the existing channel. Additionally, the majority of the culverts are "inlet" control, with flow velocity greater than 10 ft/s. These "self-cleaning" velocities help clear the culverts of sedimentation in larger storm events.

Storm drains which receive natural channel flow are susceptible to sedimentation. Storm drains will be designed with sediment traps prior to the storm drain to capture sediment.

Sedimentation is inevitable given the natural condition of the existing washes traversing the property. To help alleviate the potential concerns that arise from sediment build-up in culverts and storm drains on the project, it is recommended that the HOA implement a culvert and storm drain maintenance program. The scheduled program will inspect and clean the culverts to limit sedimentation and ensure proper operation of the drainage facilities. The program will inspect all culverts and storm drains bi-annually, and after significant storm events.

Table 4 Land Use Parameters

Land Use Code	Description	IA	RTIMP	Vegetation Cover
R1-18	Min Lot Size = 13,500 Sq Ft	0.30	27	50.0
R1-35	Min Lot Size = 26,2500 Sq Ft	0.30	21	50.0
R1-43	Min Lot Size = 32,250 Sq Ft	0.30	17	20.0
R1-70	Min Lot Size = 52,500 Sq Ft	0.30	14	20.0
Road	24' Roadway, 40' Tract/ROW	0.10	60	75.0
Natural Desert	Natural Desert	0.35	0	25.0

A stage storage and outfall rate calculation spreadsheet was prepared for the proposed detention basins. The state storage volume is based on end-area calculations at 1-foot intervals. The basin discharge rates through the proposed bleed pipes is calculated from Manning and Orifice equations. Overflow for larger storm events are provided in an overflow weir, which will be sized at final design. Stage storage and discharge rate tables are provided in **Appendix B**.

HYDRAULICS

100-year BFEs for the significant washes were established using the U.S. Army Corps of Engineers HEC-RAS (v4.1.1) computer program. Cross sections were cut for the existing washes using the 1' flown aerial topography. The hydraulic models were run using mixed flow regime conditions with the normal depth boundary condition. Manning's 'n' coefficients for the channels was set at 0.035 and values for the overbanks are 0.050. Values were selected from Table 3-1 of the HEC-RAS Reference Manual. See **Appendix C** for Table 3-1. Based on field observations and aerial photography the washes are an undisturbed natural desert with an impervious weed barrier. One flow profile is used in the existing condition model representing the design flow. The proposed condition model uses two flow profiles. The first is a baseline of the design flow, the second is the same base design flow with the development encroachments included in the model.

Culvert crossing of the significant washes were sized using the Federal Highway Administration HY-8 version 7.30 computer program. Culverts were preliminary size to convey at least the 10-year storm through the structure, and convey the 100-year flow with a maximum roadway overtopping of 12-inches.

Refer to **Appendix C** for the results of the hydraulic modeling for the existing and proposed condition. See the attached CD for copy of the HEC-RAS report for the existing and proposed condition.

STORMWATER STORAGE METHOD

The existing property is a part of the ESLO. Based on new City ordinances, a waiver will need to be obtained for any volume less than the 100-year, 2-hour volume. However, there is no waiver fee associated with the

volumes that do not result in an increase in downstream runoff. See **Appendix D** for a copy of the waiver. Refer to **Appendix B** for the pre- and post-development hydrologic model results.

Where detention basins are provided within the development to capture runoff generated on-site and discharged from roadway improvements, the basins have been sized to meet first flush storage requirements (See First Flush Summary Table in **Appendix B**). In specific areas within the development, a detention basin is not feasible to meet the first flush criteria. As outlined in the City's Stormwater and Floodplain Management Ordinance, an alternative stormwater control can be provided if the development is located within the upper desert landform and runoff has no additional adverse impact on other properties. The locations where an alternative method is proposed are identified on the preliminary grading and drainage plan (**Appendix E**) and do not adversely impact any adjacent properties. In various areas, a rip-rap spillway and small dissipation basin is proposed as an alternative stormwater control. The rip-rap basins are proposed to be 1-foot deep and sized to reduce the velocity entering the basin for better capture of sedimentation and potential contaminants that may be present. The basin bottom was calculated using the rip-rap apron dimension requirements as outlined in the Drainage Design Manual for Maricopa County, Table 8.6. The spillways will be designed for a median rip-rap size (D50) of 6 inches to convey flow at 6-inch flow depth for the 2-year, 10-minute design storm. The higher frequency storm events are appropriate when evaluating water quality and represents the first-half inch of rainfall within the street network. Refer to **Appendix C** for the spillway and dissipation basin calculations.

There are other options for stormwater quality that could be considered for this project such as a Stormceptor system or other oil grit separators on the market. If a particular area on the project warrants this type of application in the future, specific stormwater control design measures will be provided for the City's review and approval during final design.

CONCLUSIONS

- Multiple significant washes cross the development. Proposed development will encroach on the washes. Hydraulic models for the existing and proposed conditions were prepared to determine the BFE. The BFE was used to set the finished elevations for each lot.

- Significant washes are maintained in their existing corridors whenever possible. Modifications to significant washes result is improved continuous NAOS.

- Onsite runoff will be conveyed through the local streets and storm drains to the detention basins and wash corridors. Culverts will convey the flow under the new roads. The conveyance facilities will be sized during final design.

- Hydrologic models were prepared for the on-site and off-site areas for the pre- and post-development conditions. Onsite detention basins were sized to ensure that the post-development runoff exiting the site are equal or less than pre-development conditions. Basins are design to drain within 36 hours.

- A Level 1 Erosion Setback analysis was performed for each major wash corridor. Locations where the setback is located within future development will require an erosion protection. The erosion protection will be designed as part of the final design. The Erosion Setback is shown on the Preliminary Grading Plan.

- Where detention basins are provided within the development to capture runoff generated on-site and discharged from roadway improvements, the basins have been sized to meet first flush storage requirements (See First Flush Summary Table in Appendix **B**). In specific areas within the development, a detention basin is not feasible to meet the first flush criteria. As outlined in the City's Stormwater and Floodplain Management Ordinance, an alternative stormwater control can be provided if the development is located within the upper desert landform and runoff has no additional adverse impact on other properties. In various areas, a rip-rap spillway and small dissipation basin is proposed as an alternative stormwater control.

Appendix A – Flood Insurance Rate Map

990000 FT

985000 FT

JOINS PANEL 1330

E YEARLING RD

N 128TH ST

E DALEY LN

E PINNACLE PEAK

N 132ND PL

MARICOPA COU
UNINCORPORATED
040037

ZONE D

ZONE D

43576-1

43577-1

43558-1

43559-1

43560-1

43557-1

43556-1

43538-1

43539-1M

43540-1M

1

2

6

7

11

12

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 EX

n	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTH:ETA	Kb	Description
or Basin ID: 01									
105	DESERT	0.0851	100.0	0.35	0	25.0	DRY	0.056	Desert
		0.0851	**100.0**						
110	DESERT	0.0369	100.0	0.35	0	25.0	DRY	0.061	Desert
		0.0369	**100.0**						
115	DESERT	0.0065	100.0	0.35	0	25.0	DRY	0.071	Desert
		0.0065	**100.0**						
120	DESERT	0.0950	100.0	0.35	0	25.0	DRY	0.055	Desert
		0.0950	**100.0**						
125	DESERT	0.1094	100.0	0.35	0	25.0	DRY	0.055	Desert
		0.1094	**100.0**						
130	DESERT	0.0180	100.0	0.35	0	25.0	DRY	0.065	Desert
		0.0180	**100.0**						
135	DESERT	0.0569	100.0	0.35	0	25.0	DRY	0.059	Desert
		0.0569	**100.0**						
140	DESERT	0.0347	100.0	0.35	0	25.0	DRY	0.061	Desert
		0.0347	**100.0**						
145	DESERT	0.0044	100.0	0.35	0	25.0	DRY	0.074	Desert
		0.0044	**100.0**						
150	DESERT	0.0035	100.0	0.35	0	25.0	DRY	0.074	Desert
		0.0035	**100.0**						

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 EX

n	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
or Basin ID: 01									
155	DESERT	0.0041	100.0	0.35	0	25.0	DRY	0.074	Desert
		0.0041	**100.0**						
160	DESERT	0.0354	100.0	0.35	0	25.0	DRY	0.061	Desert
		0.0354	**100.0**						
165	DESERT	0.0029	100.0	0.35	0	25.0	DRY	0.076	Desert
		0.0029	**100.0**						
175	DESERT	0.0018	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0018	**100.0**						
180	DESERT	0.0065	100.0	0.35	0	25.0	DRY	0.071	Desert
		0.0065	**100.0**						
185	DESERT	0.0051	100.0	0.35	0	25.0	DRY	0.073	Desert
		0.0051	**100.0**						
215	DESERT	0.0302	100.0	0.35	0	25.0	DRY	0.062	Desert
		0.0302	**100.0**						
220	DESERT	0.0028	100.0	0.35	0	25.0	DRY	0.076	Desert
		0.0028	**100.0**						
225	DESERT	0.0046	100.0	0.35	0	25.0	DRY	0.073	Desert
		0.0046	**100.0**						
230	DESERT	0.0067	100.0	0.35	0	25.0	DRY	0.071	Desert
		0.0067	**100.0**						

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 EX

in	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
jor Basin ID: 01									
235	DESERT	0.0024	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0024	**100.0**						
240	DESERT	0.0071	100.0	0.35	0	25.0	DRY	0.071	Desert
		0.0071	**100.0**						
245	DESERT	0.0033	100.0	0.35	0	25.0	DRY	0.076	Desert
		0.0033	**100.0**						
250	DESERT	0.0094	100.0	0.35	0	25.0	DRY	0.070	Desert
		0.0094	**100.0**						
255	DESERT	0.0020	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0020	**100.0**						
260	DESERT	0.0026	100.0	0.35	0	25.0	DRY	0.076	Desert
		0.0026	**100.0**						
265	DESERT	0.0018	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0018	**100.0**						
270	DESERT	0.0022	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0022	**100.0**						
280	DESERT	0.0008	100.0	0.35	0	25.0	DRY	0.083	Desert
		0.0008	**100.0**						
285	DESERT	0.0087	100.0	0.35	0	25.0	DRY	0.070	Desert
		0.0087	**100.0**						

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 EX

n	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
or Basin ID: 01									
?90	DESERT	0.0056	100.0	0.35	0	25.0	DRY	0.072	Desert
		0.0056	**100.0**						
?95	DESERT	0.0050	100.0	0.35	0	25.0	DRY	0.073	Desert
		0.0050	**100.0**						
300	DESERT	0.0040	100.0	0.35	0	25.0	DRY	0.074	Desert
		0.0040	**100.0**						
305	DESERT	0.0207	100.0	0.35	0	25.0	DRY	0.064	Desert
		0.0207	**100.0**						
310	DESERT	0.0376	100.0	0.35	0	25.0	DRY	0.061	Desert
		0.0376	**100.0**						
315	DESERT	0.0155	100.0	0.35	0	25.0	DRY	0.066	Desert
		0.0155	**100.0**						
320	DESERT	0.0014	100.0	0.35	0	25.0	DRY	0.083	Desert
		0.0014	**100.0**						
325	DESERT	0.0161	100.0	0.35	0	25.0	DRY	0.066	Desert
		0.0161	**100.0**						
330	DESERT	0.0014	100.0	0.35	0	25.0	DRY	0.083	Desert
		0.0014	**100.0**						
335	DESERT	0.0156	100.0	0.35	0	25.0	DRY	0.066	Desert
		0.0156	**100.0**						

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 EX

in	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
jor Basin ID: 01									
340	DESERT	0.0082	100.0	0.35	0	25.0	DRY	0.070	Desert
		0.0082	**100.0**						
345	DESERT	0.0028	100.0	0.35	0	25.0	DRY	0.076	Desert
		0.0028	**100.0**						
350	DESERT	0.0008	100.0	0.35	0	25.0	DRY	0.083	Desert
		0.0008	**100.0**						
355	DESERT	0.0020	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0020	**100.0**						
360	DESERT	0.0016	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0016	**100.0**						

* Non default value

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
OFF105	645	61	64561	0.085	100.00	0.150	-	100	
OFF110	645	61	64561	0.037	100.00	0.150	-	100	
OFF115	645	61	64561	0.007	100.00	0.150	-	100	
OFF120	645	61	64561	0.094	99.20	0.150	-	100	
	645	63	64563	0.001	0.80	0.140	25.00	100	
OFF125	645	61	64561	0.100	91.60	0.150	-	100	
	645	63	64563	0.009	8.40	0.140	25.00	100	
OFF130	645	61	64561	0.018	100.00	0.150	-	100	
OFF135	645	61	64561	0.056	98.40	0.150	-	100	
	645	63	64563	0.001	1.60	0.140	25.00	100	
OFF140	645	61	64561	0.035	100.00	0.150	-	100	
OFF145	645	61	64561	0.004	100.00	0.150	-	100	
OFF150	645	61	64561	0.004	100.00	0.150	-	100	
OFF155	645	61	64561	0.004	100.00	0.150	-	100	
OFF160	645	61	64561	0.035	100.00	0.150	-	100	
OFF165	645	61	64561	0.003	100.00	0.150	-	100	
OFF175	645	61	64561	0.002	100.00	0.150	-	100	
OFF180	645	61	64561	0.007	100.00	0.150	-	100	
OFF185	645	61	64561	0.005	100.00	0.150	-	100	
ON215	645	61	64561	0.030	100.00	0.150	-	100	
ON220	645	61	64561	0.003	100.00	0.150	-	100	
ON225	645	61	64561	0.005	100.00	0.150	-	100	
ON230	645	61	64561	0.007	100.00	0.150	-	100	
ON235	645	61	64561	0.002	100.00	0.150	-	100	
ON240	645	61	64561	0.007	100.00	0.150	-	100	
ON245	645	61	64561	0.003	100.00	0.150	-	100	
ON250	645	61	64561	0.009	100.00	0.150	-	100	
ON255	645	61	64561	0.002	100.00	0.150	-	100	
ON260	645	61	64561	0.003	100.00	0.150	-	100	
ON265	645	61	64561	0.002	100.00	0.150	-	100	
ON270	645	61	64561	0.002	100.00	0.150	-	100	
ON280	645	61	64561	0.001	100.00	0.150	-	100	
ON285	645	61	64561	0.009	100.00	0.150	-	100	
ON290	645	61	64561	0.006	100.00	0.150	-	100	
ON295	645	61	64561	0.005	100.00	0.150	-	100	
ON300	645	61	64561	0.004	100.00	0.150	-	100	
ON305	645	61	64561	0.021	100.00	0.150	-	100	
ON310	645	61	64561	0.038	100.00	0.150	-	100	
ON315	645	61	64561	0.016	100.00	0.150	-	100	
ON320	645	61	64561	0.001	100.00	0.150	-	100	
ON325	645	61	64561	0.016	100.00	0.150	-	100	
ON330	645	61	64561	0.001	100.00	0.150	-	100	
ON335	645	61	64561	0.016	100.00	0.150	-	100	
ON340	645	61	64561	0.008	100.00	0.150	-	100	
ON345	645	61	64561	0.003	100.00	0.150	-	100	
ON35	645	61	64561	0.001	100.00	0.150	-	100	
ON350	645	61	64561	0.001	100.00	0.150	-	100	

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
ON355	645	61	64561	0.002	100.00	0.150	-	100	
ON360	645	61	64561	0.002	100.00	0.150	-	100	

Kimley»Horn

Engineering, Planning and Environmental Consultants
7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

NO.	REVISION	BY	DATE	APPR.

SCALE(H):1"= 1500'
SCALE(V): N/A
DESIGNED BY: MAW
DRAWN BY: DWT
CHECKED BY: MAW
DATE: AUGUST 2014

CAVALLIERE
EXISTING SOILS MAP

PROJECT NO.
19106913

DRAWING NAME
Existing_Soils.mxd

Flood Control District of Maricopa County
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: STORYROCK PH3 EX

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
NORMAL DEPTH															
Major Basin 01															
RO215A	0.050	0.035	0.050	975.00	0.0360	-	X:	-	9.00	21.00	25.00	32.00	36.00	70.00	90.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO215B	0.050	0.035	0.050	800.00	0.0340	-	X:	-	6.00	10.00	13.00	19.00	21.00	26.00	62.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO215C	0.050	0.035	0.050	445.00	0.0340	-	X:	-	12.00	28.00	36.00	48.00	71.00	73.00	76.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO215D	0.050	0.035	0.050	364.00	0.0300	-	X:	-	5.00	8.00	11.00	11.10	14.00	17.00	24.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO220	0.050	0.035	0.050	310.00	0.0420	-	X:	-	8.00	15.00	21.00	21.10	25.00	30.00	36.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO230A	0.050	0.035	0.050	770.00	0.0340	-	X:	-	10.00	20.00	35.00	51.00	61.00	68.00	73.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO230B	0.050	0.035	0.050	270.00	0.0480	-	X:	-	9.00	30.00	45.00	118.00	122.00	127.00	132.00
							Y:	2.00	1.00	0.50	-	-	1.00	2.00	3.00
RO240A	0.050	0.035	0.050	245.00	0.0370	-	X:	-	5.00	10.00	14.00	32.00	41.00	48.00	52.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO240B	0.050	0.035	0.050	465.00	0.0390	-	X:	-	7.00	19.00	49.00	65.00	70.00	77.00	85.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO250A	0.050	0.035	0.050	433.00	0.0420	-	X:	-	8.00	17.00	25.00	47.00	51.00	58.00	62.00
							Y:	2.00	1.00	0.50	-	-	0.50	0.75	1.00
RO250B	0.050	0.035	0.050	650.00	0.0400	-	X:	-	26.00	31.00	38.00	39.00	44.00	58.00	68.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00

Flood Control District of Maricopa County
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: STORYROCK PH3 EX

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RO250C	0.050	0.035	0.050	402.00	0.0350	-	X:	-	26.00	31.00	38.00	39.00	44.00	58.00	68.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO250D	0.050	0.035	0.050	271.00	0.0410	-	X:	-	34.00	60.00	71.00	81.00	110.00	121.00	134.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO255	0.050	0.035	0.050	213.00	0.0470	-	X:	-	6.00	11.00	18.00	18.10	27.00	35.00	40.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO260A	0.050	0.035	0.050	225.00	0.0360	-	X:	-	7.00	15.00	26.00	29.00	34.00	42.00	50.00
							Y:	2.00	1.00	-	-	1.00	1.00	0.50	1.00
RO260B	0.050	0.035	0.050	361.00	0.0280	-	X:	-	23.00	44.00	69.00	70.00	85.00	92.00	104.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO285A	0.050	0.035	0.050	378.00	0.0420	-	X:	-	34.00	64.00	88.00	110.00	115.00	118.00	120.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO285B	0.050	0.035	0.050	543.00	0.0370	-	X:	-	12.00	12.00	14.00	14.10	19.00	24.00	28.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO285C	0.050	0.035	0.050	315.00	0.0410	-	X:	-	8.00	15.00	22.00	149.00	169.00	178.00	182.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO305A	0.050	0.035	0.050	685.00	0.0480	-	X:	-	10.00	21.00	30.00	43.00	61.00	68.00	75.00
							Y:	3.00	2.00	1.00	-	-	1.00	-	1.00
RO305B	0.050	0.035	0.050	970.00	0.0480	-	X:	-	6.00	8.00	20.00	32.00	43.00	51.00	66.00
							Y:	3.00	2.00	1.00	-	-	1.00	1.50	2.00
RO305C	0.050	0.035	0.050	653.00	0.0430	-	X:	-	10.00	15.00	26.00	43.00	155.00	165.00	169.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO310A	0.050	0.035	0.050	1,060.00	0.0420	-	X:	-	8.00	20.00	32.00	36.00	42.00	46.00	50.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00

Flood Control District of Maricopa County
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: STORYROCK PH3 EX

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RO310B	0.050	0.035	0.050	850.00	0.0470	-	X:	-	6.00	8.00	10.00	12.00	14.00	15.00	19.00
							Y:	4.00	3.00	2.00	-	-	2.00	3.00	4.00
RO310C	0.050	0.035	0.050	510.00	0.0450	-	X:	-	4.00	8.00	16.00	20.00	22.00	24.00	26.00
							Y:	3.00	2.50	2.00	-	-	2.00	3.00	4.00
RO310D	0.050	0.035	0.050	951.00	0.0440	-	X:	-	15.00	23.00	25.00	26.00	37.00	47.00	53.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO310E	0.050	0.035	0.050	1,175.00	0.0410	-	X:	-	4.00	6.00	10.00	12.00	24.00	74.00	83.00
							Y:	4.00	3.00	2.00	-	-	2.00	3.00	4.00
RO335	0.050	0.035	0.050	1,660.00	0.0430	-	X:	-	10.00	12.00	18.00	18.10	22.00	26.00	50.00
							Y:	5.00	3.00	3.00	-	-	3.00	4.00	5.00
RO340	0.050	0.035	0.050	820.00	0.0420	-	X:	-	10.00	12.00	18.00	18.10	22.00	26.00	50.00
							Y:	5.00	3.00	3.00	-	-	3.00	4.00	5.00
RO345	0.050	0.035	0.050	490.00	0.0490	-	X:	-	6.00	10.00	12.00	12.10	15.00	17.00	21.00
							Y:	5.00	3.00	3.00	-	-	3.00	4.00	5.00

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   27OCT16  TIME  22:31:25   *
*                                       *
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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1           ID        Flood Control District of Maricopa County
  2           ID        STORYROCK PH3 EX - STORYROCK PHASE 3 EXISTING CONDITION
  3           ID        2 YEAR
  4           ID        6 Hour · Storm
  5           ID        Unit Hydrograph: Clark
  6           ID        Storm: Multiple
  7           ID        10/27/2016
              *DIAGRAM
  8           IT       5  1JAN99      0    2000
  9           IO       5
 10           IN      15
              *
 11           JD   1.419  0.0001
 12           PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
 13           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
 14           PC   0.962   0.972   0.983   0.991   1.000
 15           JD   1.410  0.5000
 16           PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
 17           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
 18           PC   0.962   0.972   0.983   0.991   1.000
 19           JD   1.384     2.8
 20           PC   0.000   0.009   0.016   0.025   0.034   0.042   0.051   0.059   0.067   0.076
 21           PC   0.087   0.100   0.120   0.163   0.252   0.451   0.694   0.837   0.900   0.938
 22           PC   0.950   0.963   0.975   0.988   1.000
              *

 23           KK  OFF105   BASIN
 24           BA   0.085
 25           LG    0.35    0.40    6.00    0.18       0
 26           UC   0.538   0.678
 27           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 28           UA     100
              *

 29           KK  RO215A   ROUTE
 30           RS       1    FLOW
 31           RC   0.050   0.035   0.050     975  0.0360    0.00
 32           RX    0.00    9.00   21.00   25.00   32.00   36.00   70.00   90.00
 33           RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
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   34          KK  OFF110   BASIN
   35          BA  0.037
   36          LG   0.35    0.40    6.00    0.18       0
   37          UC  0.428   0.595
   38          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   39          UA     100
               *

   40          KK  OFF115   BASIN
   41          BA  0.007
   42          LG   0.35    0.40    6.00    0.18       0
   43          UC  0.227   0.236
   44          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   45          UA     100
               *
```



```
LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   46          KK   RO220   ROUTE
   47          RS       1    FLOW       -
   48          RC   0.050   0.035   0.050     310  0.0420    0.00
   49          RX    0.00    8.00   15.00   21.00   21.10   25.00   30.00   36.00
   50          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
               *

   51          KK   ON220   BASIN
   52          BA   0.003
   53          LG    0.35    0.40    6.00    0.18       0
   54          UC   0.222   0.326
   55          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   56          UA     100
               *

   57          KK   CO220 COMBINE
   58          HC       2
               *

   59          KK  RO215D   ROUTE
   60          RS       1    FLOW
   61          RC   0.050   0.035   0.050     364  0.0300    0.00
   62          RX    0.00    5.00    8.00   11.00   11.10   14.00   17.00   24.00
   63          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
               *

   64          KK  CO215A COMBINE
   65          HC       2
               *

   66          KK  RO215B   ROUTE
   67          RS       1    FLOW
   68          RC   0.050   0.035   0.050     800  0.0340    0.00
   69          RX    0.00    6.00   10.00   13.00   19.00   21.00   26.00   62.00
   70          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
               *

   71          KK  CO215B COMBINE
   72          HC       2
               *

   73          KK  RO215C   ROUTE
   74          RS       1    FLOW
   75          RC   0.050   0.035   0.050     445  0.0340    0.00
   76          RX    0.00   12.00   28.00   36.00   48.00   71.00   73.00   76.00
   77          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
               *

   78          KK   ON215   BASIN
   79          BA   0.030
   80          LG    0.35    0.40    6.00    0.18       0
   81          UC   0.349   0.341
   82          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   83          UA     100
               *
```

```
 84          KK  CO215C COMBINE
 85          HC       2
             *

 86          KK  RO240A   ROUTE
 87          RS       1    FLOW
 88          RC   0.050   0.035   0.050     245  0.0370    0.00
 89          RX    0.00    5.00   10.00   14.00   32.00   41.00   48.00   52.00
 90          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

 91          KK   ON235   BASIN
 92          BA   0.002
 93          LG    0.35    0.40    6.00    0.18       0
 94          UC   0.176   0.222
 95          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 96          UA     100
             *

 97          KK  CO240A COMBINE
 98          HC       2
             *

 99          KK  RO240B   ROUTE
100          RS       1    FLOW
101          RC   0.050   0.035   0.050     465  0.0390    0.00
102          RX    0.00    7.00   19.00   49.00   65.00   70.00   77.00   85.00
103          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

104          KK   ON240   BASIN
105          BA   0.007
106          LG    0.35    0.40    6.00    0.18       0
107          UC   0.276   0.380
108          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
109          UA     100
             *

110          KK  CO240B COMBINE
111          HC       2
             *

112          KK  RO260A   ROUTE
113          RS       1    FLOW
114          RC   0.050   0.035   0.050     225  0.0360    0.00
115          RX    0.00    7.00   15.00   26.00   29.00   34.00   42.00   50.00
116          RY    2.00    1.00    0.00    0.00    1.00    1.00    0.50    1.00
             *
```



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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117          KK   ON245   BASIN
118          BA   0.003
119          LG    0.35    0.40    6.00    0.18       0
120          UC   0.230   0.363
121          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
122          UA     100
             *

123          KK  RO260B   ROUTE
124          RS       1    FLOW
125          RC   0.050   0.035   0.050     361  0.0280    0.00
126          RX    0.00   23.00   44.00   69.00   70.00   85.00   92.00  104.00
127          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

128          KK   ON260   BASIN
129          BA   0.003
130          LG    0.35    0.40    6.00    0.18       0
131          UC   0.212   0.265
132          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
133          UA     100
             *
```

```
                *
  136           KK   ON265   BASIN
  137           BA   0.002
  138           LG    0.35    0.40    6.00    0.18       0
  139           UC   0.203   0.318
  140           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  141           UA     100
                *
  142           KK   ON270   BASIN
  143           BA   0.002
  144           LG    0.35    0.40    6.00    0.18       0
  145           UC   0.193   0.273
  146           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  147           UA     100
                *
  148           KK   ON280   BASIN
  149           BA   0.001
  150           LG    0.35    0.40    6.00    0.18       0
  151           UC   0.136   0.158
  152           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  153           UA     100
                *
1                                        HEC-1 INPUT                                        PAGE  5

 LINE           ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  154           KK  OFF120   BASIN
  155           BA   0.095
  156           LG    0.35    0.40    6.00    0.18       0
  157           UC   0.566   0.825
  158           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  159           UA     100
                *
  160           KK  RO305A   ROUTE
  161           RS       1    FLOW
  162           RC   0.050   0.035   0.050     685  0.0480    0.00
  163           RX    0.00   10.00   21.00   30.00   43.00   61.00   68.00   75.00
  164           RY    3.00    2.00    1.00    0.00    0.00    1.00    0.00    1.00
                *
  165           KK  OFF125   BASIN
  166           BA   0.109
  167           LG    0.35    0.40    6.00    0.18       2
  168           UC   0.594   0.883
  169           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  170           UA     100
                *
  171           KK  RO305B   ROUTE
  172           RS       1    FLOW
  173           RC   0.050   0.035   0.050     970  0.0480    0.00
  174           RX    0.00    6.00    8.00   20.00   32.00   43.00   51.00   66.00
  175           RY    3.00    2.00    1.00    0.00    0.00    1.00    1.50    2.00
                *
  176           KK  CO305A COMBINE
  177           HC       2
                *
  178           KK  RO305C   ROUTE
  179           RS       1    FLOW
  180           RC   0.050   0.035   0.050     653  0.0430    0.00
  181           RX    0.00   10.00   15.00   26.00   43.00  155.00  165.00  169.00
  182           RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *
  183           KK   ON305   BASIN
  184           BA   0.021
  185           LG    0.35    0.40    6.00    0.18       0
  186           UC   0.356   0.437
  187           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  188           UA     100
                *
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 189          KK  CO305B COMBINE
 190          HC       2
              *

 191          KK  RO230B   ROUTE
 192          RS       1    FLOW
 193          RC   0.050   0.035   0.050     270  0.0480    0.00
 194          RX    0.00    9.00   30.00   45.00  118.00  122.00  127.00  132.00
 195          RY    2.00    1.00    0.50    0.00    0.00    1.00    2.00    3.00
              *

 196          KK   ON225   BASIN
 197          BA   0.005
 198          LG    0.35    0.40    6.00    0.18       0
 199          UC   0.223   0.263
 200          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 201          UA     100
              *

 202          KK  RO230A   ROUTE
 203          RS       1    FLOW
 204          RC   0.050   0.035   0.050     770  0.0340    0.00
 205          RX    0.00   10.00   20.00   35.00   51.00   61.00   68.00   73.00
 206          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

 207          KK   ON230   BASIN
 208          BA   0.007
 209          LG    0.35    0.40    6.00    0.18       0
 210          UC   0.277   0.348
 211          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 212          UA     100
              *

 213          KK   CO230 COMBINE
 214          HC       3
              *

 215          KK  RO250A   ROUTE
 216          RS       1    FLOW
 217          RC   0.050   0.035   0.050     433  0.0420    0.00
 218          RX    0.00    8.00   17.00   25.00   47.00   51.00   58.00   62.00
 219          RY    2.00    1.00    0.50    0.00    0.00    0.50    0.75    1.00
              *

 220          KK   ON320   BASIN
 221          BA   0.001
 222          LG    0.35    0.40    6.00    0.18       0
 223          UC   0.182   0.341
 224          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 225          UA     100
              *
```



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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 226          KK  RO250B   ROUTE
 227          RS       1    FLOW
 228          RC   0.050   0.035   0.050     650  0.0400    0.00
 229          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
 230          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

 231          KK   ON315   BASIN
 232          BA   0.016
 233          LG    0.35    0.40    6.00    0.18       0
 234          UC   0.369   0.545
 235          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 236          UA     100
              *

 237          KK  RO250C   ROUTE
```

```
240          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
241          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

242          KK  CO250A COMBINE
243          HC       3
             *

244          KK  RO250D   ROUTE
245          RS       1    FLOW
246          RC   0.050   0.035   0.050     271  0.0410    0.00
247          RX    0.00   34.00   60.00   71.00   81.00  110.00  121.00  134.00
248          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

249          KK   ON250   BASIN
250          BA   0.009
251          LG    0.35    0.40    6.00    0.18       0
252          UC   0.277   0.331
253          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
254          UA     100
             *

255          KK  CO250B COMBINE
256          HC       2
             *

257          KK  RO285A   ROUTE
258          RS       1    FLOW
259          RC   0.050   0.035   0.050     378  0.0420    0.00
260          RX    0.00   34.00   64.00   88.00  110.00  115.00  118.00  120.00
261          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

262          KK   ON330   BASIN
263          BA   0.001
264          LG    0.35    0.40    6.00    0.18       0
265          UC   0.179   0.334
266          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
267          UA     100
             *

268          KK   RO255   ROUTE
269          RS       1    FLOW
270          RC   0.050   0.035   0.050     213  0.0470    0.00
271          RX    0.00    6.00   11.00   18.00   18.10   27.00   35.00   40.00
272          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

273          KK   ON255   BASIN
274          BA   0.002
275          LG    0.35    0.40    6.00    0.18       0
276          UC   0.176   0.221
277          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
278          UA     100
             *

279          KK   CO255 COMBINE
280          HC       2
             *

281          KK  RO285B   ROUTE
282          RS       1    FLOW
283          RC   0.050   0.035   0.050     543  0.0370    0.00
284          RX    0.00   12.00   12.00   14.00   14.10   19.00   24.00   28.00
285          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

286          KK  CO285A COMBINE
287          HC       2
             *

288          KK  RO285C   ROUTE
```

```
291          RX    0.00    8.00   15.00   22.00  149.00  169.00  178.00  182.00
292          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

293          KK   ON285   BASIN
294          BA   0.009
295          LG    0.35    0.40    6.00    0.18       0
296          UC   0.274   0.327
297          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
298          UA     100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

299          KK  CO285B COMBINE
300          HC       2
             *

301          KK   ON325   BASIN
302          BA   0.016
303          LG    0.35    0.40    6.00    0.18       0
304          UC   0.417   0.739
305          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
306          UA     100
             *

307          KK   ON360   BASIN
308          BA   0.002
309          LG    0.35    0.40    6.00    0.18       0
310          UC   0.171   0.214
311          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
312          UA     100
             *

313          KK  COEX1 COMBINE
314          HC       5
             *

315          KK  OFF130   BASIN
316          BA   0.018
317          LG    0.35    0.40    6.00    0.18       0
318          UC   0.305   0.343
319          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
320          UA     100
             *

321          KK  OFF135   BASIN
322          BA   0.057
323          LG    0.35    0.40    6.00    0.18       0
324          UC   0.578   1.063
325          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
326          UA     100
             *

327          KK  CO310A COMBINE
328          HC       2
             *

329          KK  RO310A   ROUTE
330          RS       1    FLOW
331          RC   0.050   0.035   0.050    1060  0.0420    0.00
332          RX    0.00    8.00   20.00   32.00   36.00   42.00   46.00   50.00
333          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

334          KK  OFF145   BASIN
335          BA   0.004
336          LG    0.35    0.40    6.00    0.18       0
337          UC   0.231   0.331
338          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
339          UA     100
             *
```

```
340          KK  RO310B   ROUTE
341          RS       1    FLOW
342          RC   0.050   0.035   0.050     850  0.0470    0.00
343          RX    0.00    6.00    8.00   10.00   12.00   14.00   15.00   19.00
344          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *

345          KK  CO310B COMBINE
346          HC       2
             *

347          KK  RO310C   ROUTE
348          RS       1    FLOW
349          RC   0.050   0.035   0.050     510  0.0450    0.00
350          RX    0.00    4.00    8.00   16.00   20.00   22.00   24.00   26.00
351          RY    3.00    2.50    2.00    0.00    0.00    2.00    3.00    4.00
             *

352          KK  OFF150   BASIN
353          BA   0.004
354          LG    0.35    0.40    6.00    0.18       0
355          UC   0.244   0.374
356          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
357          UA     100
             *

358          KK  RO310D   ROUTE
359          RS       1    FLOW
360          RC   0.050   0.035   0.050     951  0.0440    0.00
361          RX    0.00   15.00   23.00   25.00   26.00   37.00   47.00   53.00
362          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

363          KK  CO310C COMBINE
364          HC       2
             *

365          KK  RO310E   ROUTE
366          RS       1    FLOW
367          RC   0.050   0.035   0.050    1175  0.0410    0.00
368          RX    0.00    4.00    6.00   10.00   12.00   24.00   74.00   83.00
369          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

370          KK   ON310   BASIN
371          BA   0.038
372          LG    0.35    0.40    6.00    0.18       0
373          UC   0.441   0.647
374          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
375          UA     100
             *

376          KK  CO310D COMBINE
377          HC       2
             *

378          KK   ON355   BASIN
379          BA   0.002
380          LG    0.35    0.40    6.00    0.18       0
381          UC   0.158   0.174
382          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
383          UA     100
             *

384          KK  OFF140   BASIN
385          BA   0.035
386          LG    0.35    0.40    6.00    0.18       0
387          UC   0.423   0.570
388          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
389          UA     100
             *

390          KK   RO335   ROUTE
```

```
393          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
394          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

395          KK   ON335   BASIN
396          BA   0.016
397          LG    0.35    0.40    6.00    0.18       0
398          UC   0.363   0.510
399          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
400          UA     100
             *

401          KK   CO335 COMBINE
402          HC       2
             *

403          KK  OFF155   BASIN
404          BA   0.004
405          LG    0.35    0.40    6.00    0.18       0
406          UC   0.258   0.441
407          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
408          UA     100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

409          KK  OFF160   BASIN
410          BA   0.035
411          LG    0.35    0.40    6.00    0.18       0
412          UC   0.503   0.916
413          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
414          UA     100
             *

415          KK  CO340A COMBINE
416          HC       2
             *

417          KK   RO340   ROUTE
418          RS       1    FLOW
419          RC   0.050   0.035   0.050     820  0.0420    0.00
420          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
421          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

422          KK   ON340   BASIN
423          BA   0.008
424          LG    0.35    0.40    6.00    0.18       0
425          UC   0.323   0.545
426          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
427          UA     100
             *

428          KK  CO340B COMBINE
429          HC       2
             *

430          KK  OFF165   BASIN
431          BA   0.003
432          LG    0.35    0.40    6.00    0.18       0
433          UC   0.182   0.203
434          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
435          UA     100
             *

436          KK   RO345   ROUTE
437          RS       1    FLOW
438          RC   0.050   0.035   0.050     490  0.0490    0.00
439          RX    0.00    6.00   10.00   12.00   12.10   15.00   17.00   21.00
440          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

441          KK   ON345   BASIN
442          BA   0.003
443          LG    0.35    0.40    6.00    0.18       0
```

```
          446          UA     100
                       *
1                                                      HEC-1 INPUT                                            PAGE 13

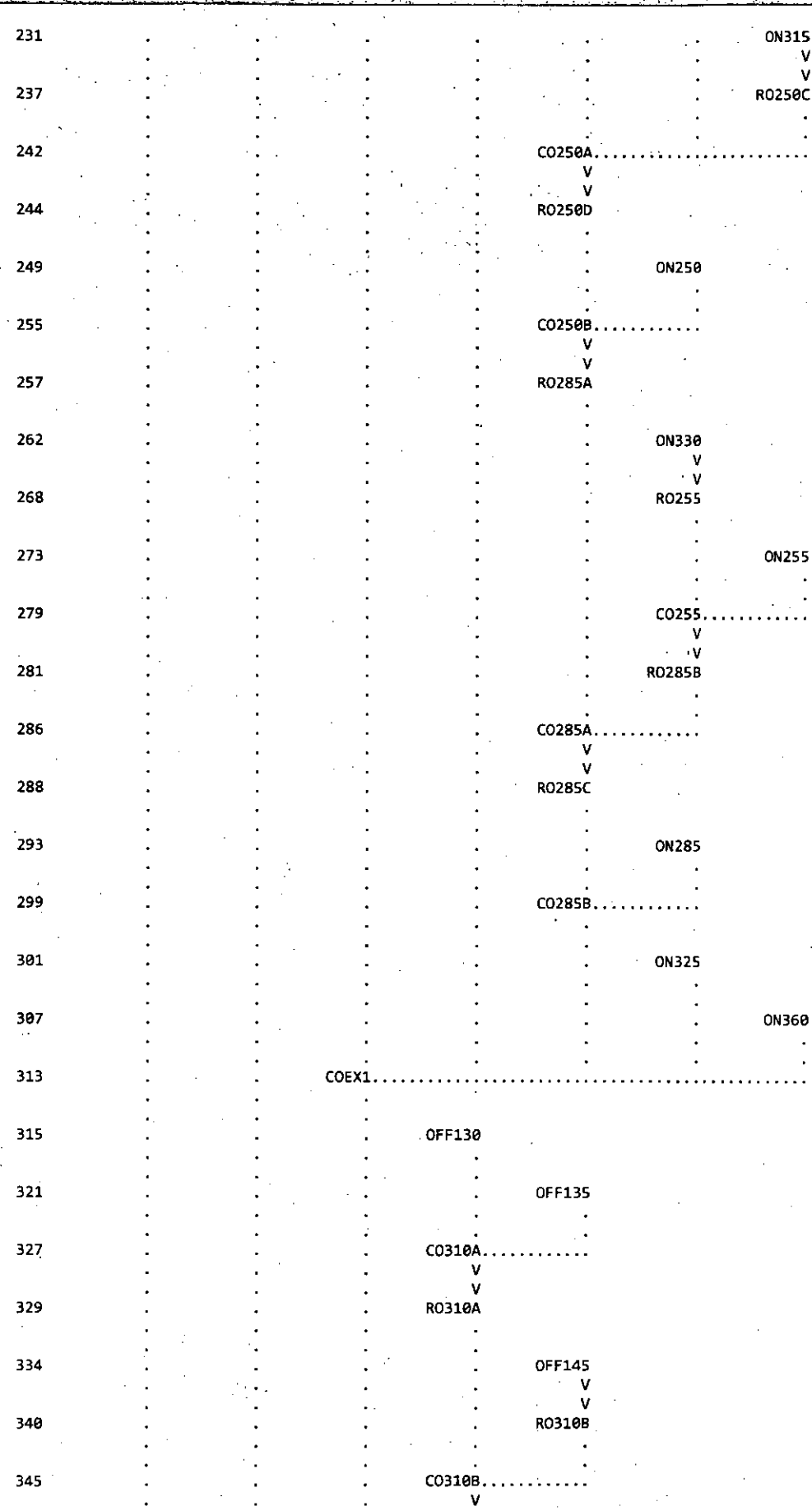
         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          447          KK   CO345 COMBINE
          448          HC       2
                       *

          449          KK   ON350   BASIN
          450          BA   0.001
          451          LG    0.35    0.40    6.00    0.18       0
          452          UC   0.164   0.270
          453          UA      .0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          454          UA     100
                       *
          455          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23     OFF105
                V
                V
    29     RO215A
                .
                .
    34          .     OFF110
                .          .
                .          .
    40          .          .     OFF115
                .          .          V
                .          .          V
    46          .          .      RO220
                .          .          .
                .          .          .
    51          .          .          .     ON220
                .          .          .          .
                .          .          .          .
    57          .          .      CO220...........
                .          .          V
                .          .          V
    59          .          .     RO215D
                .          .          .
                .          .          .
    64          .     CO215A...........
                .          V
                .          V
    66          .     RO215B
                .          .
                .          .
    71     CO215B...........
                V
                V
    73     RO215C
                .
                .
    78          .      ON215
                .          .
                .          .
    84     CO215C...........
                V
                V
    86     RO240A
                .
                .
    91          .      ON235
                .          .
                .          .
    97     CO240A...........
                V
                V
    99     RO240B
```


231
ON315
237
RO250C
242
CO250A
244
RO250D
249
ON250
255
CO250B
257
RO285A
262
ON330
268
RO255
273
ON255
279
CO255
281
RO285B
286
CO285A
288
RO285C
293
ON285
299
CO285B
301
ON325
307
ON360
313
COEX1
315
OFF130
321
OFF135
327
CO310A
329
RO310A
334
OFF145
340
RO310B
345
CO310B

Flood Control District of Maricopa County
STORYROCK PH3 EX - STORYROCK PHASE 3 EXISTING CONDITION
2 YEAR
6 Hour Storm
Unit Hydrograph: Clark
Storm: Multiple
10/27/2016

```
 9 IO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                     NMIN          5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1JAN99  STARTING DATE
                    ITIME        0000  STARTING TIME
                       NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      7JAN99  ENDING DATE
                   NDTIME        2235  ENDING TIME
                    ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     0.08 HOURS
                     TOTAL TIME BASE   166.58 HOURS

       ENGLISH UNITS
            DRAINAGE AREA         SQUARE MILES
            PRECIPITATION DEPTH   INCHES
            LENGTH, ELEVATION     FEET
            FLOW                  CUBIC FEET PER SECOND
            STORAGE VOLUME        ACRE-FEET
            SURFACE AREA          ACRES
            TEMPERATURE           DEGREES FAHRENHEIT

11 JD          INDEX STORM NO. 1
                     STRM       1.42  PRECIPITATION DEPTH
                     TRDA       0.00  TRANSPOSITION DRAINAGE AREA

12 PI           PRECIPITATION PATTERN
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.03
                  0.03    0.03    0.05    0.05    0.05    0.15    0.15    0.15    0.03    0.03
                  0.03    0.01    0.01    0.01    0.01    0.01    0.01    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00

15 JD          INDEX STORM NO. 2
                     STRM       1.41  PRECIPITATION DEPTH
                     TRDA       0.50  TRANSPOSITION DRAINAGE AREA

16 PI           PRECIPITATION PATTERN
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.03
                  0.03    0.03    0.05    0.05    0.05    0.15    0.15    0.15    0.03    0.03
                  0.03    0.01    0.01    0.01    0.01    0.01    0.01    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00

19 JD          INDEX STORM NO. 3
                     STRM       1.38  PRECIPITATION DEPTH
                     TRDA       2.80  TRANSPOSITION DRAINAGE AREA

20 PI           PRECIPITATION PATTERN
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
                  0.00    0.00    0.00    0.01    0.01    0.01    0.01    0.01    0.01    0.03
                  0.03    0.03    0.07    0.07    0.07    0.08    0.08    0.08    0.05    0.05
                  0.05    0.02    0.02    0.02    0.01    0.01    0.01    0.00    0.00    0.00
                  0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00    0.00
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	OFF105	17.	4.42	3.	1.	0.	0.09		
+	ROUTED TO	RO215A	16.	4.50	3.	1.	0.	0.09		
+	HYDROGRAPH AT	OFF110	8.	4.33	1.	0.	0.	0.04		
+	HYDROGRAPH AT	OFF115	3.	4.17	0.	0.	0.	0.01		
+	ROUTED TO	RO220	3.	4.17	0.	0.	0.	0.01		
+	HYDROGRAPH AT	ON220	1.	4.17	0.	0.	0.	0.00		
+	2 COMBINED AT	CO220	4.	4.17	0.	0.	0.	0.01		
+	ROUTED TO	RO215D	4.	4.17	0.	0.	0.	0.01		
+	2 COMBINED AT	CO215A	12.	4.25	1.	0.	0.	0.05		
+	ROUTED TO	RO215B	11.	4.33	1.	0.	0.	0.05		
+	2 COMBINED AT	CO215B	26.	4.42	4.	1.	0.	0.13		
+	ROUTED TO	RO215C	26.	4.50	4.	1.	0.	0.13		
+	HYDROGRAPH AT	ON215	10.	4.25	1.	0.	0.	0.03		
+	2 COMBINED AT	CO215C	32.	4.42	5.	1.	0.	0.16		
+	ROUTED TO	RO240A	31.	4.42	5.	1.	0.	0.16		
+	HYDROGRAPH AT	ON235	1.	4.08	0.	0.	0.	0.00		
+	2 COMBINED AT	CO240A	32.	4.42	5.	1.	0.	0.16		
+	ROUTED TO	RO240B	32.	4.50	5.	1.	0.	0.16		
+	HYDROGRAPH AT	ON240	2.	4.17	0.	0.	0.	0.01		
+	2 COMBINED AT	CO240B	33.	4.50	5.	1.	0.	0.17		
+	ROUTED TO	RO260A	33.	4.50	5.	1.	0.	0.17		
+	HYDROGRAPH AT	ON245	1.	4.17	0.	0.	0.	0.00		
+	ROUTED TO	RO260B	1.	4.25	0.	0.	0.	0.00		

3 COMBINED AT							
+	CO260	34.	4.50	6.	1.	0.	0.18
HYDROGRAPH AT							
+	ON265	1.	4.17	0.	0.	0.	0.00
HYDROGRAPH AT							
+	ON270	1.	4.17	0.	0.	0.	0.00
HYDROGRAPH AT							
+	ON280	1.	4.08	0.	0.	0.	0.00
HYDROGRAPH AT							
+	OFF120	16.	4.42	3.	1.	0.	0.09
ROUTED TO							
+	RO305A	16.	4.50	3.	1.	0.	0.09
HYDROGRAPH AT							
+	OFF125	18.	4.42	4.	1.	0.	0.11
ROUTED TO							
+	RO305B	18.	4.50	4.	1.	0.	0.11
2 COMBINED AT							
+	CO305A	34.	4.50	7.	2.	1.	0.20
ROUTED TO							
+	RO305C	33.	4.58	7.	2.	1.	0.20
HYDROGRAPH AT							
+	ON305	6.	4.25	1.	0.	0.	0.02
2 COMBINED AT							
+	CO305B	36.	4.58	7.	2.	1.	0.22
ROUTED TO							
+	RO230B	37.	4.58	7.	2.	1.	0.22
HYDROGRAPH AT							
+	ON225	2.	4.17	0.	0.	0.	0.00
ROUTED TO							
+	RO230A	2.	4.25	0.	0.	0.	0.00
HYDROGRAPH AT							
+	ON230	2.	4.17	0.	0.	0.	0.01
3 COMBINED AT							
+	CO230	38.	4.58	8.	2.	1.	0.24
ROUTED TO							
+	RO250A	38.	4.58	8.	2.	1.	0.24
HYDROGRAPH AT							
+	ON320	0.	4.17	0.	0.	0.	0.00
ROUTED TO							
+	RO250B	0.	4.25	0.	0.	0.	0.00
HYDROGRAPH AT							
+	ON315	4.	4.25	1.	0.	0.	0.02
ROUTED TO							
+	RO250C	4.	4.33	1.	0.	0.	0.02
3 COMBINED AT							
+	CO250A	41.	4.58	8.	2.	1.	0.25
ROUTED TO							
+	RO250D	41.	4.58	8.	2.	1.	0.25
HYDROGRAPH AT							
+	ON250	3.	4.17	0.	0.	0.	0.01
2 COMBINED AT							

	ROUTED TO							
+		RO285A	42.	4.58	9.	2.	1.	0.26
	HYDROGRAPH AT							
+		ON330	0.	4.17	0.	0.	0.	0.00
	ROUTED TO							
+		RO255	0.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT							
+		ON255	1.	4.08	0.	0.	0.	0.00
	2 COMBINED AT							
+		CO255	1.	4.17	0.	0.	0.	0.00
	ROUTED TO							
+		RO285B	1.	4.17	0.	0.	0.	0.00
	2 COMBINED AT							
+		CO285A	42.	4.58	9.	2.	1.	0.27
	ROUTED TO							
+		RO285C	42.	4.67	9.	2.	1.	0.27
	HYDROGRAPH AT							
+		ON285	3.	4.17	0.	0.	0.	0.01
	2 COMBINED AT							
+		CO285B	43.	4.67	9.	2.	1.	0.27
	HYDROGRAPH AT							
+		ON325	3.	4.33	1.	0.	0.	0.02
	HYDROGRAPH AT							
+		ON360	1.	4.08	0.	0.	0.	0.00
	5 COMBINED AT							
+		COEX1	45.	4.67	10.	2.	1.	0.30
	HYDROGRAPH AT							
+		OFF130	6.	4.25	1.	0.	0.	0.02
	HYDROGRAPH AT							
+		OFF135	8.	4.42	2.	0.	0.	0.06
	2 COMBINED AT							
+		CO310A	12.	4.42	2.	1.	0.	0.08
	ROUTED TO							
+		RO310A	12.	4.42	2.	1.	0.	0.08
	HYDROGRAPH AT							
+		OFF145	1.	4.17	0.	0.	0.	0.00
	ROUTED TO							
+		RO310B	1.	4.25	0.	0.	0.	0.00
	2 COMBINED AT							
+		CO310B	13.	4.42	2.	1.	0.	0.08
	ROUTED TO							
+		RO310C	12.	4.42	2.	1.	0.	0.08
	HYDROGRAPH AT							
+		OFF150	1.	4.17	0.	0.	0.	0.00
	ROUTED TO							
+		RO310D	1.	4.25	0.	0.	0.	0.00
	2 COMBINED AT							
+		CO310C	13.	4.42	3.	1.	0.	0.08
	ROUTED TO							
+		RO310E	13.	4.50	3.	1.	0.	0.08
	HYDROGRAPH AT							
+		ON310	8.	4.33	1.	0.	0.	0.04

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   27OCT16  TIME  22:31:29   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

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

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1           ID        Flood Control District of Maricopa County
  2           ID        STORYROCK PH3 EX - STORYROCK PHASE 3 EXISTING CONDITION
  3           ID        10 YEAR
  4           ID        6 Hour  Storm
  5           ID        Unit Hydrograph: Clark
  6           ID        Storm: Multiple
  7           ID        10/27/2016
              *DIAGRAM
  8           IT      5  1JAN99      0    2000
  9           IO      5
 10           IN     15
              *
 11           JD  2.105  0.0001
 12           PC  0.000   0.008  0.016  0.025  0.033  0.041  0.050  0.058  0.066  0.074
 13           PC  0.087   0.099  0.118  0.138  0.216  0.377  0.834  0.911  0.931  0.950
 14           PC  0.962   0.972  0.983  0.991  1.000
 15           JD  2.092  0.5000
 16           PC  0.000   0.008  0.016  0.025  0.033  0.041  0.050  0.058  0.066  0.074
 17           PC  0.087   0.099  0.118  0.138  0.216  0.377  0.834  0.911  0.931  0.950
 18           PC  0.962   0.972  0.983  0.991  1.000
 19           JD  2.052     2.8
 20           PC  0.000   0.009  0.016  0.025  0.034  0.042  0.051  0.059  0.067  0.076
 21           PC  0.087   0.100  0.120  0.163  0.252  0.451  0.694  0.837  0.900  0.938
 22           PC  0.950   0.963  0.975  0.988  1.000
              *

 23           KK  OFF105   BASIN
 24           BA  0.085
 25           LG   0.35    0.40   6.00   0.18      0
 26           UC  0.447   0.552
 27           UA      0     3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
 28           UA    100
              *

 29           KK  RO215A   ROUTE
 30           RS      1    FLOW
 31           RC  0.050   0.035  0.050    975 0.0360   0.00
 32           RX   0.00    9.00  21.00  25.00  32.00  36.00  70.00  90.00
 33           RY   2.00    0.50   1.00   0.00   0.00   1.00   0.00   2.00
              *
```

```
34          KK  OFF110   BASIN
35          BA   0.037
36          LG    0.35    0.40    6.00    0.18       0
37          UC   0.356   0.484
38          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
39          UA     100
            *

40          KK  OFF115   BASIN
41          BA   0.007
42          LG    0.35    0.40    6.00    0.18       0
43          UC   0.189   0.192
44          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
45          UA     100
            *
```



```
LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

46          KK   RO220   ROUTE
47          RS       1    FLOW
48          RC   0.050   0.035   0.050     310  0.0420    0.00
49          RX    0.00    8.00   15.00   21.00   21.10   25.00   30.00   36.00
50          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

51          KK   ON220   BASIN
52          BA   0.003
53          LG    0.35    0.40    6.00    0.18       0
54          UC   0.184   0.266
55          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
56          UA     100
            *

57          KK   CO220 COMBINE
58          HC       2
            *

59          KK  RO215D   ROUTE
60          RS       1    FLOW
61          RC   0.050   0.035   0.050     364  0.0300    0.00
62          RX    0.00    5.00    8.00   11.00   11.10   14.00   17.00   24.00
63          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *

64          KK  CO215A COMBINE
65          HC       2
            *

66          KK  RO215B   ROUTE
67          RS       1    FLOW
68          RC   0.050   0.035   0.050     800  0.0340    0.00
69          RX    0.00    6.00   10.00   13.00   19.00   21.00   26.00   62.00
70          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

71          KK  CO215B COMBINE
72          HC       2
            *

73          KK  RO215C   ROUTE
74          RS       1    FLOW
75          RC   0.050   0.035   0.050     445  0.0340    0.00
76          RX    0.00   12.00   28.00   36.00   48.00   71.00   73.00   76.00
77          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

78          KK   ON215   BASIN
79          BA   0.030
80          LG    0.35    0.40    6.00    0.18       0
81          UC   0.290   0.278
82          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
83          UA     100
            *
```

```
 84          KK  CO215C COMBINE
 85          HC       2
             *

 86          KK  RO240A   ROUTE
 87          RS       1    FLOW
 88          RC   0.050   0.035   0.050     245  0.0370    0.00
 89          RX    0.00    5.00   10.00   14.00   32.00   41.00   48.00   52.00
 90          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

 91          KK   ON235   BASIN
 92          BA   0.002
 93          LG    0.35    0.40    6.00    0.18       0
 94          UC   0.146   0.181
 95          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 96          UA     100
             *

 97          KK  CO240A COMBINE
 98          HC       2
             *

 99          KK  RO240B   ROUTE
100          RS       1    FLOW
101          RC   0.050   0.035   0.050     465  0.0390    0.00
102          RX    0.00    7.00   19.00   49.00   65.00   70.00   77.00   85.00
103          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

104          KK   ON240   BASIN
105          BA   0.007
106          LG    0.35    0.40    6.00    0.18       0
107          UC   0.229   0.309
108          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
109          UA     100
             *

110          KK  CO240B COMBINE
111          HC       2
             *

112          KK  RO260A   ROUTE
113          RS       1    FLOW
114          RC   0.050   0.035   0.050     225  0.0360    0.00
115          RX    0.00    7.00   15.00   26.00   29.00   34.00   42.00   50.00
116          RY    2.00    1.00    0.00    0.00    1.00    1.00    0.50    1.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117          KK   ON245   BASIN
118          BA   0.003
119          LG    0.35    0.40    6.00    0.18       0
120          UC   0.191   0.296
121          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
122          UA     100
             *

123          KK  RO260B   ROUTE
124          RS       1    FLOW
125          RC   0.050   0.035   0.050     361  0.0280    0.00
126          RX    0.00   23.00   44.00   69.00   70.00   85.00   92.00  104.00
127          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

128          KK   ON260   BASIN
129          BA   0.003
130          LG    0.35    0.40    6.00    0.18       0
131          UC   0.176   0.215
132          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
133          UA     100
             *

134          KK  CO260 COMBINE
```

```
                *
      136       KK   ON265   BASIN
      137       BA   0.002
      138       LG    0.35    0.40    6.00    0.18       0
      139       UC   0.169   0.259
      140       UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
      141       UA     100
                *
      142       KK   ON270   BASIN
      143       BA   0.002
      144       LG    0.35    0.40    6.00    0.18       0
      145       UC   0.160   0.222
      146       UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
      147       UA     100
                *
      148       KK   ON280   BASIN
      149       BA   0.001
      150       LG    0.35    0.40    6.00    0.18       0
      151       UC   0.113   0.129
      152       UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
      153       UA     100
                *
1                                        HEC-1 INPUT                                        PAGE  5

     LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

      154       KK  OFF120   BASIN
      155       BA   0.095
      156       LG    0.35    0.40    6.00    0.18       0
      157       UC   0.470   0.671
      158       UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
      159       UA     100
                *
      160       KK  RO305A   ROUTE
      161       RS       1    FLOW
      162       RC   0.050   0.035   0.050     685  0.0480    0.00
      163       RX    0.00   10.00   21.00   30.00   43.00   61.00   68.00   75.00
      164       RY    3.00    2.00    1.00    0.00    0.00    1.00    0.00    1.00
                *
      165       KK  OFF125   BASIN
      166       BA   0.109
      167       LG    0.35    0.40    6.00    0.18       2
      168       UC   0.495   0.722
      169       UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
      170       UA     100
                *
      171       KK  RO305B   ROUTE
      172       RS       1    FLOW
      173       RC   0.050   0.035   0.050     970  0.0480    0.00
      174       RX    0.00    6.00    8.00   20.00   32.00   43.00   51.00   66.00
      175       RY    3.00    2.00    1.00    0.00    0.00    1.00    1.50    2.00
                *
      176       KK  CO305A COMBINE
      177       HC       2
                *
      178       KK  RO305C.  ROUTE
      179       RS       1    FLOW
      180       RC   0.050   0.035   0.050     653  0.0430    0.00
      181       RX    0.00   10.00   15.00   26.00   43.00  155.00  165.00  169.00
      182       RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *
      183       KK   ON305   BASIN
      184       BA   0.021
      185       LG    0.35    0.40    6.00    0.18       0
      186       UC   0.295   0.356
      187       UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
      188       UA     100
                *
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  189         KK  CO305B COMBINE
  190         HC       2
              *

  191         KK  RO230B   ROUTE
  192         RS       1    FLOW
  193         RC   0.050   0.035   0.050     270  0.0480    0.00
  194         RX    0.00    9.00   30.00   45.00  118.00  122.00  127.00  132.00
  195         RY    2.00    1.00    0.50    0.00    0.00    1.00    2.00    3.00
              *

  196         KK   ON225   BASIN
  197         BA   0.005
  198         LG    0.35    0.40    6.00    0.18       0
  199         UC   0.186   0.214
  200         UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  201         UA     100
              *

  202         KK  RO230A   ROUTE
  203         RS       1    FLOW
  204         RC   0.050   0.035   0.050     770  0.0340    0.00
  205         RX    0.00   10.00   20.00   35.00   51.00   61.00   68.00   73.00
  206         RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

  207         KK   ON230   BASIN
  208         BA   0.007
  209         LG    0.35    0.40    6.00    0.18       0
  210         UC   0.230   0.283
  211         UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  212         UA     100
              *

  213         KK   CO230 COMBINE
  214         HC       3
              *

  215         KK  RO250A   ROUTE
  216         RS       1    FLOW
  217         RC   0.050   0.035   0.050     433  0.0420    0.00
  218         RX    0.00    8.00   17.00   25.00   47.00   51.00   58.00   62.00
  219         RY    2.00    1.00    0.50    0.00    0.00    0.50    0.75    1.00
              *

  220         KK   ON320   BASIN
  221         BA   0.001
  222         LG    0.35    0.40    6.00    0.18       0
  223         UC   0.151   0.277
  224         UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  225         UA     100
              *

1                                   HEC-1 INPUT                                   PAGE  7

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  226         KK  RO250B   ROUTE
  227         RS       1    FLOW
  228         RC   0.050   0.035   0.050     650  0.0400    0.00
  229         RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
  230         RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

  231         KK   ON315   BASIN
  232         BA   0.016
  233         LG    0.35    0.40    6.00    0.18       0
  234         UC   0.306   0.443
  235         UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  236         UA     100
              *

  237         KK  RO250C   ROUTE
```

```
240          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
241          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

242          KK  CO250A COMBINE
243          HC       3
             *

244          KK  RO250D   ROUTE
245          RS       1    FLOW
246          RC   0.050   0.035   0.050     271  0.0410    0.00
247          RX    0.00   34.00   60.00   71.00   81.00  110.00  121.00  134.00
248          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

249          KK   ON250   BASIN
250          BA   0.009
251          LG    0.35    0.40    6.00    0.18       0
252          UC   0.230   0.269
253          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
254          UA     100
             *

255          KK  CO250B COMBINE
256          HC       2
             *

257          KK  RO285A   ROUTE
258          RS       1    FLOW
259          RC   0.050   0.035   0.050     378  0.0420    0.00
260          RX    0.00   34.00   64.00   88.00  110.00  115.00  118.00  120.00
261          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

262          KK   ON330   BASIN
263          BA   0.001
264          LG    0.35    0.40    6.00    0.18       0
265          UC   0.148   0.272
266          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
267          UA     100
             *

268          KK   RO255   ROUTE
269          RS       1    FLOW
270          RC   0.050   0.035   0.050     213  0.0470    0.00
271          RX    0.00    6.00   11.00   18.00   18.10   27.00   35.00   40.00
272          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

273          KK   ON255   BASIN
274          BA   0.002
275          LG    0.35    0.40    6.00    0.18       0
276          UC   0.146   0.180
277          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
278          UA     100
             *

279          KK   CO255 COMBINE
280          HC       2
             *

281          KK  RO285B   ROUTE
282          RS       1    FLOW
283          RC   0.050   0.035   0.050     543  0.0370    0.00
284          RX    0.00   12.00   12.00   14.00   14.10   19.00   24.00   28.00
285          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

286          KK  CO285A COMBINE
287          HC       2
             *

288          KK  RO285C   ROUTE
```

```
291          RX    0.00    8.00   15.00   22.00  149.00  169.00  178.00  182.00
292          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

293          KK   ON285   BASIN
294          BA   0.009
295          LG    0.35    0.40    6.00    0.18       0
296          UC   0.228   0.266
297          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
298          UA     100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

299          KK  CO285B COMBINE
300          HC       2
             *

301          KK   ON325   BASIN
302          BA   0.016
303          LG    0.35    0.40    6.00    0.18       0
304          UC   0.347   0.602
305          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
306          UA     100
             *

307          KK   ON360   BASIN
308          BA   0.002
309          LG    0.35    0.40    6.00    0.18       0
310          UC   0.142   0.174
311          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
312          UA     100
             *

313          KK   COEX1 COMBINE
314          HC       5
             *

315          KK  OFF130   BASIN
316          BA   0.018
317          LG    0.35    0.40    6.00    0.18       0
318          UC   0.253   0.279
319          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
320          UA     100
             *

321          KK  OFF135   BASIN
322          BA   0.057
323          LG    0.35    0.40    6.00    0.18       0
324          UC   0.480   0.865
325          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
326          UA     100
             *

327          KK  CO310A COMBINE
328          HC       2
             *

329          KK  RO310A   ROUTE
330          RS       1    FLOW
331          RC   0.050   0.035   0.050    1060  0.0420    0.00
332          RX    0.00    8.00   20.00   32.00   36.00   42.00   46.00   50.00
333          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

334          KK  OFF145   BASIN
335          BA   0.004
336          LG    0.35    0.40    6.00    0.18       0
337          UC   0.192   0.269
338          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
339          UA     100
             *
```

```
340          KK  RO310B   ROUTE
341          RS       1    FLOW
342          RC   0.050   0.035   0.050     850  0.0470    0.00
343          RX    0.00    6.00    8.00   10.00   12.00   14.00   15.00   19.00
344          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *

345          KK  CO310B COMBINE
346          HC       2
             *

347          KK  RO310C   ROUTE
348          RS       1    FLOW
349          RC   0.050   0.035   0.050     510  0.0450    0.00
350          RX    0.00    4.00    8.00   16.00   20.00   22.00   24.00   26.00
351          RY    3.00    2.50    2.00    0.00    0.00    2.00    3.00    4.00
             *

352          KK  OFF150   BASIN
353          BA   0.004
354          LG    0.35    0.40    6.00    0.18       0
355          UC   0.203   0.304
356          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
357          UA     100
             *

358          KK  RO310D   ROUTE
359          RS       1    FLOW
360          RC   0.050   0.035   0.050     951  0.0440    0.00
361          RX    0.00   15.00   23.00   25.00   26.00   37.00   47.00   53.00
362          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

363          KK  CO310C COMBINE
364          HC       2
             *

365          KK  RO310E   ROUTE
366          RS       1    FLOW
367          RC   0.050   0.035   0.050    1175  0.0410    0.00
368          RX    0.00    4.00    6.00   10.00   12.00   24.00   74.00   83.00
369          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

370          KK   ON310   BASIN
371          BA   0.038
372          LG    0.35    0.40    6.00    0.18       0
373          UC   0.366   0.527
374          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
375          UA     100
             *

376          KK  CO310D COMBINE
377          HC       2
             *

378          KK   ON355   BASIN
379          BA   0.002
380          LG    0.35    0.40    6.00    0.18       0
381          UC   0.131   0.141
382          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
383          UA     100
             *

384          KK  OFF140   BASIN
385          BA   0.035
386          LG    0.35    0.40    6.00    0.18       0
387          UC   0.351   0.464
388          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
389          UA     100
             *

390          KK   RO335   ROUTE
391          RS       1    FLOW
```

```
393          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
394          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

395          KK   ON335   BASIN
396          BA   0.016
397          LG    0.35    0.40    6.00    0.18       0
398          UC   0.302   0.415
399          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
400          UA     100
             *

401          KK   CO335 COMBINE
402          HC       2
             *

403          KK  OFF155   BASIN
404          BA   0.004
405          LG    0.35    0.40    6.00    0.18       0
406          UC   0.214   0.359
407          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
408          UA     100
             *
1                                        HEC-1 INPUT                                    PAGE 12

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

409          KK  OFF160   BASIN
410          BA   0.035
411          LG    0.35    0.40    6.00    0.18       0
412          UC   0.418   0.746
413          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
414          UA     100
             *

415          KK  CO340A COMBINE
416          HC       2
             *

417          KK   RO340   ROUTE
418          RS       1    FLOW
419          RC   0.050   0.035   0.050     820  0.0420    0.00
420          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
421          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

422          KK   ON340   BASIN
423          BA   0.008
424          LG    0.35    0.40    6.00    0.18       0
425          UC   0.268   0.444
426          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
427          UA     100
             *

428          KK  CO340B COMBINE
429          HC       2
             *

430          KK  OFF165   BASIN
431          BA   0.003
432          LG    0.35    0.40    6.00    0.18       0
433          UC   0.151   0.165
434          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
435          UA     100
             *

436          KK   RO345   ROUTE
437          RS       1    FLOW
438          RC   0.050   0.035   0.050     490  0.0490    0.00
439          RX    0.00    6.00   10.00   12.00   12.10   15.00   17.00   21.00
440          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

441          KK   ON345   BASIN
442          BA   0.003
443          LG    0.35    0.40    6.00    0.18       0
```

```
            446           UA     100
                          *
1                                                          HEC-1 INPUT                                             PAGE 13

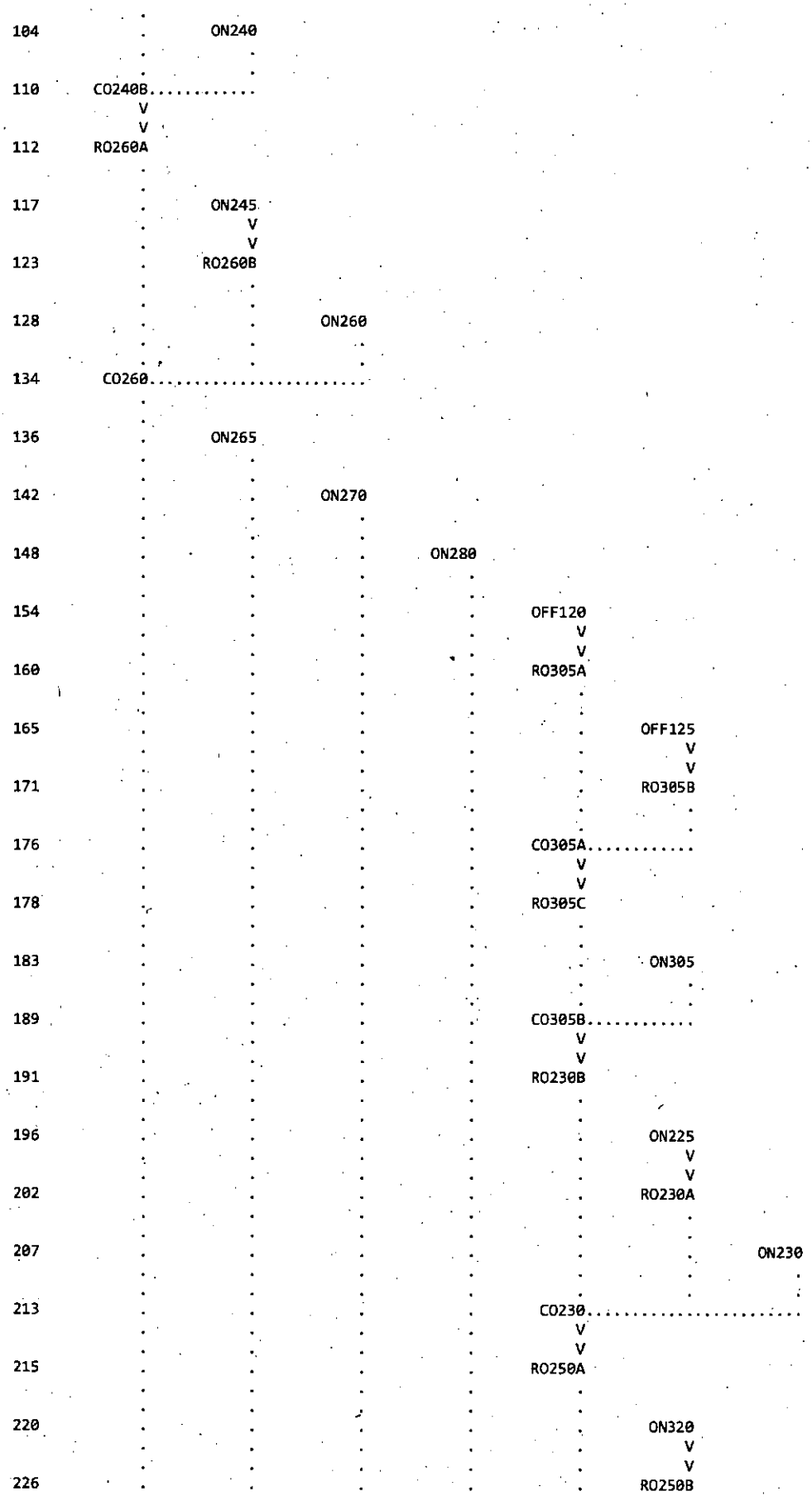
           LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


            447           KK   CO345 COMBINE
            448           HC       2
                          *

            449           KK   ON350   BASIN
            450           BA   0.001
            451           LG    0.35    0.40    6.00    0.18       0
            452           UC   0.137   0.219
            453           UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
            454           UA     100
                          *
            455           ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING         (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR       (<---) RETURN OF DIVERTED OR PUMPED FLOW

    23      OFF105
                 V
                 V
    29      RO215A
                 .
                 .
    34           .      OFF110
                 .           .
                 .           .
    40           .           .      OFF115
                 .           .           V
                 .           .           V
    46           .           .       RO220
                 .           .           .
                 .           .           .
    51           .           .           .      ON220
                 .           .           .          .
                 .           .           .          .
    57           .           .       CO220............
                 .           .           V
                 .           .           V
    59           .           .      RO215D
                 .           .           .
                 .           .           .
    64           .      CO215A............
                 .           V
                 .           V
    66           .      RO215B
                 .           .
                 .           .
    71      CO215B............
                 V
                 V
    73      RO215C
                 .
                 .
    78           .       ON215
                 .           .
                 .           .
    84      CO215C............
                 V
                 V
    86      RO240A
                 .
                 .
    91           .       ON235
                 .           .
                 .           .
    97      CO240A............
                 V
                 V
    99      RO240B
```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RO260A
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ON245
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RO260B
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ON260
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CO260
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ON265
142
ON270
148
ON280
154
OFF120
160
RO305A
165
OFF125
171
RO305B
176
CO305A
178
RO305C
183
ON305
189
CO305B
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RO230B
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ON225
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RO230A
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ON230
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CO230
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RO250A
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ON320
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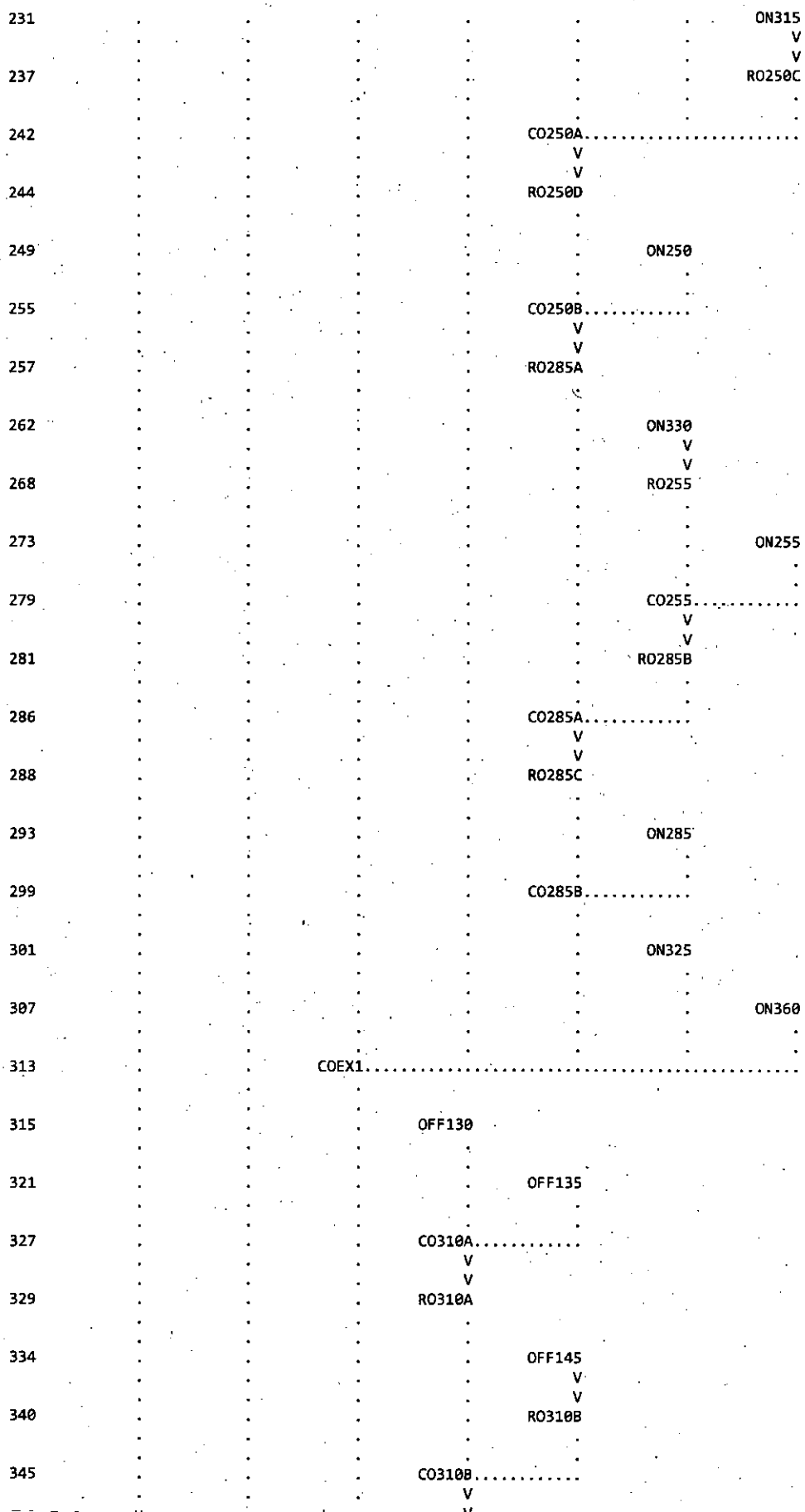
RO250B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RO250D
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ON250
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CO250B
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RO255
273
ON255
279
CO255
281
RO285B
286
CO285A
288
RO285C
293
ON285
299
CO285B
301
ON325
307
ON360
313
COEX1
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OFF135
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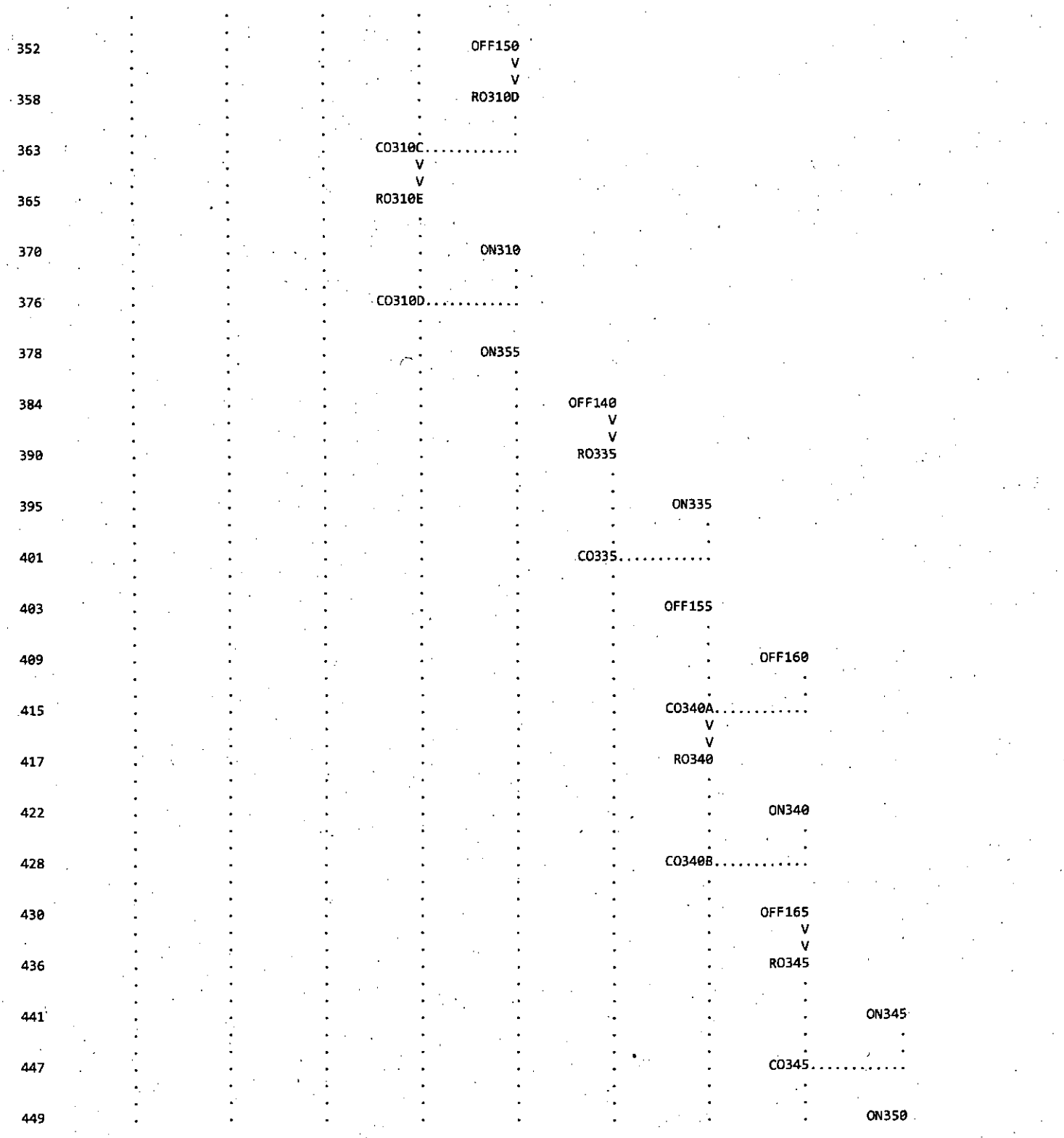
CO310A
329
RO310A
334
OFF145
340
RO310B
345
CO310B



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   27OCT16  TIME  22:31:29   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

Flood Control District of Maricopa County
STORYROCK PH3 EX - STORYROCK PHASE 3 EXISTING CONDITION
10 YEAR
6 Hour Storm
Unit Hydrograph: Clark
Storm: Multiple
10/27/2016

9 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	1JAN99	STARTING DATE
ITIME	0000	STARTING TIME
NQ	2000	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	7JAN99	ENDING DATE
NDTIME	2235	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL 0.08 HOURS
TOTAL TIME BASE 166.58 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

11 JD INDEX STORM NO. 1

STRM	2.11	PRECIPITATION DEPTH
TRDA	0.00	TRANSPOSITION DRAINAGE AREA

12 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.03
0.03	0.03	0.05	0.05	0.05	0.15	0.15	0.15	0.03	0.03
0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00								

15 JD INDEX STORM NO. 2

STRM	2.09	PRECIPITATION DEPTH
TRDA	0.50	TRANSPOSITION DRAINAGE AREA

16 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.03
0.03	0.03	0.05	0.05	0.05	0.15	0.15	0.15	0.03	0.03
0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00								

19 JD INDEX STORM NO. 3

STRM	2.05	PRECIPITATION DEPTH
TRDA	2.80	TRANSPOSITION DRAINAGE AREA

20 PI PRECIPITATION PATTERN

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.03
0.03	0.03	0.07	0.07	0.07	0.08	0.08	0.08	0.05	0.05
0.05	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	OFF105	49.	4.33	7.	2.	1.	0.09		
+	ROUTED TO	RO215A	46.	4.42	7.	2.	1.	0.09		
+	HYDROGRAPH AT	OFF110	24.	4.25	3.	1.	0.	0.04		
+	HYDROGRAPH AT	OFF115	8.	4.08	1.	0.	0.	0.01		
+	ROUTED TO	RO220	8.	4.17	1.	0.	0.	0.01		
+	HYDROGRAPH AT	ON220	3.	4.08	0.	0.	0.	0.00		
+	2 COMBINED AT	CO220	11.	4.08	1.	0.	0.	0.01		
+	ROUTED TO	RO215D	11.	4.17	1.	0.	0.	0.01		
+	2 COMBINED AT	CO215A	33.	4.25	4.	1.	0.	0.05		
+	ROUTED TO	RO215B	32.	4.25	4.	1.	0.	0.05		
+	2 COMBINED AT	CO215B	75.	4.33	10.	3.	1.	0.13		
+	ROUTED TO	RO215C	74.	4.33	10.	3.	1.	0.13		
+	HYDROGRAPH AT	ON215	28.	4.17	2.	1.	0.	0.03		
+	2 COMBINED AT	CO215C	93.	4.33	13.	3.	1.	0.16		
+	ROUTED TO	RO240A	93.	4.33	13.	3.	1.	0.16		
+	HYDROGRAPH AT	ON235	2.	4.08	0.	0.	0.	0.00		
+	2 COMBINED AT	CO240A	94.	4.33	13.	3.	1.	0.16		
+	ROUTED TO	RO240B	94.	4.33	13.	3.	1.	0.16		
+	HYDROGRAPH AT	ON240	6.	4.17	1.	0.	0.	0.01		
+	2 COMBINED AT	CO240B	97.	4.33	13.	3.	1.	0.17		
+	ROUTED TO	RO260A	97.	4.33	13.	3.	1.	0.17		
+	HYDROGRAPH AT	ON245	3.	4.08	0.	0.	0.	0.00		
+	ROUTED TO	RO260B	3.	4.17	0.	0.	0.	0.00		
+	HYDROGRAPH AT									

+	3 COMBINED AT CO260	100.	4.33	14.	3.	1.	0.18
+	HYDROGRAPH AT ON265	2.	4.08	0.	0.	0.	0.00
+	HYDROGRAPH AT ON270	2.	4.08	0.	0.	0.	0.00
+	HYDROGRAPH AT ON280	1.	4.00	0.	0.	0.	0.00
+	HYDROGRAPH AT OFF120	47.	4.33	7.	2.	1.	0.09
+	ROUTED TO RO305A	46.	4.42	7.	2.	1.	0.09
+	HYDROGRAPH AT OFF125	52.	4.33	9.	2.	1.	0.11
+	ROUTED TO RO305B	52.	4.42	9.	2.	1.	0.11
+	2 COMBINED AT CO305A	98.	4.42	16.	4.	1.	0.20
+	ROUTED TO RO305C	97.	4.42	16.	4.	1.	0.20
+	HYDROGRAPH AT ON305	17.	4.17	2.	0.	0.	0.02
+	2 COMBINED AT CO305B	108.	4.42	18.	4.	1.	0.22
+	ROUTED TO RO230B	108.	4.42	18.	4.	1.	0.22
+	HYDROGRAPH AT ON225	6.	4.08	0.	0.	0.	0.00
+	ROUTED TO RO230A	5.	4.17	0.	0.	0.	0.00
+	HYDROGRAPH AT ON230	7.	4.17	1.	0.	0.	0.01
+	3 COMBINED AT CO230	113.	4.42	19.	5.	2.	0.24
+	ROUTED TO RO250A	111.	4.42	19.	5.	2.	0.24
+	HYDROGRAPH AT ON320	1.	4.08	0.	0.	0.	0.00
+	ROUTED TO RO250B	1.	4.17	0.	0.	0.	0.00
+	HYDROGRAPH AT ON315	11.	4.25	1.	0.	0.	0.02
+	ROUTED TO RO250C	11.	4.25	1.	0.	0.	0.02
+	3 COMBINED AT CO250A	120.	4.42	20.	5.	2.	0.25
+	ROUTED TO RO250D	119.	4.42	20.	5.	2.	0.25
+	HYDROGRAPH AT ON250	9.	4.17	1.	0.	0.	0.01
+	2 COMBINED AT						

+	ROUTED TO RO285A	122.	4.42	21.	5.	2.	0.26
+	HYDROGRAPH AT ON330	1.	4.08	0.	0.	0.	0.00
+	ROUTED TO RO255	1.	4.08	0.	0.	0.	0.00
+	HYDROGRAPH AT ON255	2.	4.08	0.	0.	0.	0.00
+	2 COMBINED AT CO255	3.	4.08	0.	0.	0.	0.00
+	ROUTED TO RO285B	3.	4.17	0.	0.	0.	0.00
+	2 COMBINED AT CO285A	123.	4.42	21.	5.	2.	0.27
+	ROUTED TO RO285C	123.	4.50	21.	5.	2.	0.27
+	HYDROGRAPH AT ON285	9.	4.17	1.	0.	0.	0.01
+	2 COMBINED AT CO285B	126.	4.50	22.	5.	2.	0.27
+	HYDROGRAPH AT ON325	9.	4.25	1.	0.	0.	0.02
+	HYDROGRAPH AT ON360	2.	4.08	0.	0.	0.	0.00
+	5 COMBINED AT COEX1	134.	4.42	23.	6.	2.	0.30
+	HYDROGRAPH AT OFF130	17.	4.17	1.	0.	0.	0.02
+	HYDROGRAPH AT OFF135	23.	4.33	4.	1.	0.	0.06
+	2 COMBINED AT CO310A	34.	4.25	6.	1.	0.	0.08
+	ROUTED TO RO310A	34.	4.33	6.	1.	0.	0.08
+	HYDROGRAPH AT OFF145	4.	4.08	0.	0.	0.	0.00
+	ROUTED TO RO310B	4.	4.17	0.	0.	0.	0.00
+	2 COMBINED AT CO310B	37.	4.33	6.	2.	1.	0.08
+	ROUTED TO RO310C	37.	4.33	6.	2.	1.	0.08
+	HYDROGRAPH AT OFF150	4.	4.17	0.	0.	0.	0.00
+	ROUTED TO RO310D	3.	4.17	0.	0.	0.	0.00
+	2 COMBINED AT CO310C	39.	4.33	6.	2.	1.	0.08
+	ROUTED TO RO310E	39.	4.33	6.	2.	1.	0.08
+	HYDROGRAPH AT ON310	23.	4.25	3.	1.	0.	0.04

+	CO310D	60.	4.33	9.	2.	1.	0.12
	HYDROGRAPH AT						
+	ON355	3.	4.08	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	OFF140	24.	4.25	3.	1.	0.	0.04
	ROUTED TO						
+	RO335	22.	4.33	3.	1.	0.	0.04
	HYDROGRAPH AT						
+	ON335	11.	4.25	1.	0.	0.	0.02
	2 COMBINED AT						
+	CO335	33.	4.25	4.	1.	0.	0.05
	HYDROGRAPH AT						
+	OFF155	3.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	OFF160	16.	4.33	3.	1.	0.	0.04
	2 COMBINED AT						
+	CO340A	19.	4.33	3.	1.	0.	0.04
	ROUTED TO						
+	RO340	19.	4.33	3.	1.	0.	0.04
	HYDROGRAPH AT						
+	ON340	6.	4.17	1.	0.	0.	0.01
	2 COMBINED AT						
+	CO340B	23.	4.33	4.	1.	0.	0.05
	HYDROGRAPH AT						
+	OFF165	4.	4.08	0.	0.	0.	0.00
	ROUTED TO						
+	RO345	4.	4.08	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	ON345	2.	4.17	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO345	6.	4.08	0.	0.	0.	0.01
	HYDROGRAPH AT						
+	ON350	1.	4.08	0.	0.	0.	0.00

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   27OCT16  TIME  22:31:33   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104               *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        Flood Control District of Maricopa County
   2          ID        STORYROCK PH3 EX - STORYROCK PHASE 3 EXISTING CONDITION
   3          ID        100 YEAR
   4          ID        6 Hour  Storm
   5          ID        Unit Hydrograph: Clark
   6          ID        Storm: Multiple
   7          ID        10/27/2016
              *DIAGRAM
   8          IT       5  1JAN99       0   2000
   9          IO       5
  10          IN      15
              *
  11          JD   3.174  0.0001
  12          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  13          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  14          PC   0.962   0.972   0.983   0.991   1.000
  15          JD   3.155  0.5000
  16          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  17          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  18          PC   0.962   0.972   0.983   0.991   1.000
  19          JD   3.095     2.8
  20          PC   0.000   0.009   0.016   0.025   0.034   0.042   0.051   0.059   0.067   0.076
  21          PC   0.087   0.100   0.120   0.163   0.252   0.451   0.694   0.837   0.900   0.938
  22          PC   0.950   0.963   0.975   0.988   1.000
              *

  23          KK  OFF105   BASIN
  24          BA   0.085
  25          LG    0.35    0.40    6.00    0.18       0
  26          UC   0.336   0.402
  27          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  28          UA     100
              *

  29          KK  RO215A   ROUTE
  30          RS       1    FLOW
  31          RC   0.050   0.035   0.050     975  0.0360    0.00
  32          RX    0.00    9.00   21.00   25.00   32.00   36.00   70.00   90.00
  33          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
              *
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 34          KK  OFF110   BASIN
 35          BA   0.037
 36          LG    0.35    0.40    6.00    0.18       0
 37          UC   0.268   0.353
 38          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 39          UA     100
             *

 40          KK  OFF115   BASIN
 41          BA   0.007
 42          LG    0.35    0.40    6.00    0.18       0
 43          UC   0.142   0.140
 44          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 45          UA     100
             *
1                                        HEC-1 INPUT                                    PAGE  2

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 46          KK   RO220   ROUTE
 47          RS       1    FLOW
 48          RC   0.050   0.035   0.050     310  0.0420    0.00
 49          RX    0.00    8.00   15.00   21.00   21.10   25.00   30.00   36.00
 50          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

 51          KK   ON220   BASIN
 52          BA   0.003
 53          LG    0.35    0.40    6.00    0.18       0
 54          UC   0.139   0.194
 55          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 56          UA     100
             *

 57          KK   CO220 COMBINE
 58          HC       2
             *

 59          KK  RO215D   ROUTE
 60          RS       1    FLOW
 61          RC   0.050   0.035   0.050     364  0.0300    0.00
 62          RX    0.00    5.00    8.00   11.00   11.10   14.00   17.00   24.00
 63          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

 64          KK  CO215A COMBINE
 65          HC       2
             *

 66          KK  RO215B   ROUTE
 67          RS       1    FLOW
 68          RC   0.050   0.035   0.050     800  0.0340    0.00
 69          RX    0.00    6.00   10.00   13.00   19.00   21.00   26.00   62.00
 70          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

 71          KK  CO215B COMBINE
 72          HC       2
             *

 73          KK  RO215C   ROUTE
 74          RS       1    FLOW
 75          RC   0.050   0.035   0.050     445  0.0340    0.00
 76          RX    0.00   12.00   28.00   36.00   48.00   71.00   73.00   76.00
 77          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

 78          KK   ON215   BASIN
 79          BA   0.030
 80          LG    0.35    0.40    6.00    0.18       0
 81          UC   0.218   0.202
 82          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 83          UA     100
             *
1                                        HEC-1 INPUT                                    PAGE  3

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
```

```
 84          KK  CO215C COMBINE
 85          HC       2
             *

 86          KK  RO240A   ROUTE
 87          RS       1    FLOW
 88          RC   0.050   0.035   0.050     245  0.0370    0.00
 89          RX    0.00    5.00   10.00   14.00   32.00   41.00   48.00   52.00
 90          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

 91          KK   ON235   BASIN
 92          BA   0.002
 93          LG    0.35    0.40    6.00    0.18       0
 94          UC   0.110   0.132
 95          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 96          UA     100
             *

 97          KK  CO240A COMBINE
 98          HC       2
             *

 99          KK  RO240B   ROUTE
100          RS       1    FLOW
101          RC   0.050   0.035   0.050     465  0.0390    0.00
102          RX    0.00    7.00   19.00   49.00   65.00   70.00   77.00   85.00
103          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

104          KK   ON240   BASIN
105          BA   0.007
106          LG    0.35    0.40    6.00    0.18       0
107          UC   0.172   0.225
108          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
109          UA     100
             *

110          KK  CO240B COMBINE
111          HC       2
             *

112          KK  RO260A   ROUTE
113          RS       1    FLOW
114          RC   0.050   0.035   0.050     225  0.0360    0.00
115          RX    0.00    7.00   15.00   26.00   29.00   34.00   42.00   50.00
116          RY    2.00    1.00    0.00    0.00    1.00    1.00    0.50    1.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117          KK   ON245   BASIN
118          BA   0.003
119          LG    0.35    0.40    6.00    0.18       0
120          UC   0.143   0.216
121          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
122          UA     100
             *

123          KK  RO260B   ROUTE
124          RS       1    FLOW
125          RC   0.050   0.035   0.050     361  0.0280    0.00
126          RX    0.00   23.00   44.00   69.00   70.00   85.00   92.00  104.00
127          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

128          KK   ON260   BASIN
129          BA   0.003
130          LG    0.35    0.40    6.00    0.18       0
131          UC   0.133   0.157
132          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
133          UA     100
             *

134          KK  CO260 COMBINE
```

```
                *
     136        KK   ON265   BASIN
     137        BA   0.002
     138        LG    0.35    0.40    6.00    0.18       0
     139        UC   0.127   0.189
     140        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     141        UA     100
                *

     142        KK   ON270   BASIN
     143        BA   0.002
     144        LG    0.35    0.40    6.00    0.18       0
     145        UC   0.121   0.162
     146        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     147        UA     100
                *

     148        KK   ON280   BASIN
     149        BA   0.001
     150        LG    0.35    0.40    6.00    0.18       0
     151        UC   0.085   0.094
     152        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     153        UA     100
                *
1                                        HEC-1 INPUT                                        PAGE  5

    LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

     154        KK  OFF120   BASIN
     155        BA   0.095
     156        LG    0.35    0.40    6.00    0.18       0
     157        UC   0.354   0.489
     158        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     159        UA     100
                *

     160        KK  RO305A   ROUTE
     161        RS       1    FLOW
     162        RC   0.050   0.035   0.050     685  0.0480    0.00
     163        RX    0.00   10.00   21.00   30.00   43.00   61.00   68.00   75.00
     164        RY    3.00    2.00    1.00    0.00    0.00    1.00    0.00    1.00
                *

     165        KK  OFF125   BASIN
     166        BA   0.109
     167        LG    0.35    0.40    6.00    0.18       2
     168        UC   0.374   0.528
     169        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     170        UA     100
                *

     171        KK  RO305B   ROUTE
     172        RS       1    FLOW
     173        RC   0.050   0.035   0.050     970  0.0480    0.00
     174        RX    0.00    6.00    8.00   20.00   32.00   43.00   51.00   66.00
     175        RY    3.00    2.00    1.00    0.00    0.00    1.00    1.50    2.00
                *

     176        KK  CO305A COMBINE
     177        HC       2
                *

     178        KK  RO305C   ROUTE
     179        RS       1    FLOW
     180        RC   0.050   0.035   0.050     653  0.0430    0.00
     181        RX    0.00   10.00   15.00   26.00   43.00  155.00  165.00  169.00
     182        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *

     183        KK   ON305   BASIN
     184        BA   0.021
     185        LG    0.35    0.40    6.00    0.18       0
     186        UC   0.222   0.259
     187        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     188        UA     100
                *
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 189          KK  CO305B COMBINE
 190          HC       2
              *

 191          KK  RO230B   ROUTE
 192          RS       1    FLOW
 193          RC   0.050   0.035   0.050     270  0.0480    0.00
 194          RX    0.00    9.00   30.00   45.00  118.00  122.00  127.00  132.00
 195          RY    2.00    1.00    0.50    0.00    0.00    1.00    2.00    3.00
              *

 196          KK   ON225   BASIN
 197          BA   0.005
 198          LG    0.35    0.40    6.00    0.18       0
 199          UC   0.140   0.156
 200          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 201          UA     100
              *

 202          KK  RO230A   ROUTE
 203          RS       1    FLOW
 204          RC   0.050   0.035   0.050     770  0.0340    0.00
 205          RX    0.00   10.00   20.00   35.00   51.00   61.00   68.00   73.00
 206          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

 207          KK   ON230   BASIN
 208          BA   0.007
 209          LG    0.35    0.40    6.00    0.18       0
 210          UC   0.173   0.206
 211          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 212          UA     100
              *

 213          KK   CO230 COMBINE
 214          HC       3
              *

 215          KK  RO250A   ROUTE
 216          RS       1    FLOW
 217          RC   0.050   0.035   0.050     433  0.0420    0.00
 218          RX    0.00    8.00   17.00   25.00   47.00   51.00   58.00   62.00
 219          RY    2.00    1.00    0.50    0.00    0.00    0.50    0.75    1.00
              *

 220          KK   ON320   BASIN
 221          BA   0.001
 222          LG    0.35    0.40    6.00    0.18       0
 223          UC   0.114   0.202
 224          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 225          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 226          KK  RO250B   ROUTE
 227          RS       1    FLOW
 228          RC   0.050   0.035   0.050     650  0.0400    0.00
 229          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
 230          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

 231          KK   ON315   BASIN
 232          BA   0.016
 233          LG    0.35    0.40    6.00    0.18       0
 234          UC   0.230   0.323
 235          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 236          UA     100
              *

 237          KK  RO250C   ROUTE
```

```
240          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
241          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

242          KK  CO250A COMBINE
243          HC       3
             *

244          KK  RO250D   ROUTE
245          RS       1    FLOW
246          RC   0.050   0.035   0.050     271  0.0410    0.00
247          RX    0.00   34.00   60.00   71.00   81.00  110.00  121.00  134.00
248          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

249          KK   ON250   BASIN
250          BA   0.009
251          LG    0.35    0.40    6.00    0.18       0
252          UC   0.173   0.196
253          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
254          UA     100
             *

255          KK  CO250B COMBINE
256          HC       2
             *

257          KK  RO285A   ROUTE
258          RS       1    FLOW
259          RC   0.050   0.035   0.050     378  0.0420    0.00
260          RX    0.00   34.00   64.00   88.00  110.00  115.00  118.00  120.00
261          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
```

1 HEC-1 INPUT PAGE 8

```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

262          KK   ON330   BASIN
263          BA   0.001
264          LG    0.35    0.40    6.00    0.18       0
265          UC   0.112   0.198
266          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
267          UA     100
             *

268          KK   RO255   ROUTE
269          RS       1    FLOW
270          RC   0.050   0.035   0.050     213  0.0470    0.00
271          RX    0.00    6.00   11.00   18.00   18.10   27.00   35.00   40.00
272          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

273          KK   ON255   BASIN
274          BA   0.002
275          LG    0.35    0.40    6.00    0.18       0
276          UC   0.110   0.131
277          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
278          UA     100
             *

279          KK   CO255 COMBINE
280          HC       2
             *

281          KK  RO285B   ROUTE
282          RS       1    FLOW
283          RC   0.050   0.035   0.050     543  0.0370    0.00
284          RX    0.00   12.00   12.00   14.00   14.10   19.00   24.00   28.00
285          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

286          KK  CO285A COMBINE
287          HC       2
             *

288          KK  RO285C   ROUTE
```

```
291          RX    0.00    8.00   15.00   22.00  149.00  169.00  178.00  182.00
292          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

293          KK   ON285   BASIN
294          BA   0.009
295          LG    0.35    0.40    6.00    0.18       0
296          UC   0.171   0.194
297          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
298          UA     100
             *
1                                        HEC-1 INPUT                                    PAGE  9

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

299          KK  CO285B COMBINE
300          HC       2
             *

301          KK   ON325   BASIN
302          BA   0.016
303          LG    0.35    0.40    6.00    0.18       0
304          UC   0.261   0.439
305          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
306          UA     100
             *

307          KK   ON360   BASIN
308          BA   0.002
309          LG    0.35    0.40    6.00    0.18       0
310          UC   0.107   0.127
311          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
312          UA     100
             *

313          KK   COEX1 COMBINE
314          HC       5
             *

315          KK  OFF130   BASIN
316          BA   0.018
317          LG    0.35    0.40    6.00    0.18       0
318          UC   0.191   0.204
319          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
320          UA     100
             *

321          KK  OFF135   BASIN
322          BA   0.057
323          LG    0.35    0.40    6.00    0.18       0
324          UC   0.361   0.630
325          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
326          UA     100
             *

327          KK  CO310A COMBINE
328          HC       2
             *

329          KK  RO310A   ROUTE
330          RS       1    FLOW
331          RC   0.050   0.035   0.050    1060  0.0420    0.00
332          RX    0.00    8.00   20.00   32.00   36.00   42.00   46.00   50.00
333          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
1                                        HEC-1 INPUT                                    PAGE 10

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

334          KK  OFF145   BASIN
335          BA   0.004
336          LG    0.35    0.40    6.00    0.18       0
337          UC   0.144   0.196
338          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
339          UA     100
```

```
340          KK  RO310B   ROUTE
341          RS       1   FLOW
342          RC   0.050   0.035   0.050     850  0.0470    0.00
343          RX    0.00    6.00    8.00   10.00   12.00   14.00   15.00   19.00
344          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *

345          KK  CO310B COMBINE
346          HC       2
             *

347          KK  RO310C   ROUTE
348          RS       1   FLOW
349          RC   0.050   0.035   0.050     510  0.0450    0.00
350          RX    0.00    4.00    8.00   16.00   20.00   22.00   24.00   26.00
351          RY    3.00    2.50    2.00    0.00    0.00    2.00    3.00    4.00
             *

352          KK  OFF150   BASIN
353          BA   0.004
354          LG    0.35    0.40    6.00    0.18       0
355          UC   0.153   0.222
356          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
357          UA     100
             *

358          KK  RO310D   ROUTE
359          RS       1   FLOW
360          RC   0.050   0.035   0.050     951  0.0440    0.00
361          RX    0.00   15.00   23.00   25.00   26.00   37.00   47.00   53.00
362          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

363          KK  CO310C COMBINE
364          HC       2
             *

365          KK  RO310E   ROUTE
366          RS       1   FLOW
367          RC   0.050   0.035   0.050    1175  0.0410    0.00
368          RX    0.00    4.00    6.00   10.00   12.00   24.00   74.00   83.00
369          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *
```



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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

370          KK   ON310   BASIN
371          BA   0.038
372          LG    0.35    0.40    6.00    0.18       0
373          UC   0.275   0.384
374          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
375          UA     100
             *

376          KK  CO310D COMBINE
377          HC       2
             *

378          KK   ON355   BASIN
379          BA   0.002
380          LG    0.35    0.40    6.00    0.18       0
381          UC   0.099   0.103
382          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
383          UA     100
             *

384          KK  OFF140   BASIN
385          BA   0.035
386          LG    0.35    0.40    6.00    0.18       0
387          UC   0.264   0.338
388          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
389          UA     100
             *

390          KK   RO335   ROUTE
```

```
393          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
394          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

395          KK   ON335   BASIN
396          BA   0.016
397          LG    0.35    0.40    6.00    0.18       0
398          UC   0.227   0.303
399          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
400          UA     100
             *

401          KK   CO335 COMBINE
402          HC       2
             *

403          KK  OFF155   BASIN
404          BA   0.004
405          LG    0.35    0.40    6.00    0.18       0
406          UC   0.161   0.262
407          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
408          UA     100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

409          KK  OFF160   BASIN
410          BA   0.035
411          LG    0.35    0.40    6.00    0.18       0
412          UC   0.314   0.543
413          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
414          UA     100
             *

415          KK  CO340A COMBINE
416          HC       2
             *

417          KK   RO340   ROUTE
418          RS       1    FLOW
419          RC   0.050   0.035   0.050     820  0.0420    0.00
420          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
421          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

422          KK   ON340   BASIN
423          BA   0.008
424          LG    0.35    0.40    6.00    0.18       0
425          UC   0.202   0.324
426          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
427          UA     100
             *

428          KK  CO340B COMBINE
429          HC       2
             *

430          KK  OFF165   BASIN
431          BA   0.003
432          LG    0.35    0.40    6.00    0.18       0
433          UC   0.114   0.120
434          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
435          UA     100
             *

436          KK   RO345   ROUTE
437          RS       1    FLOW
438          RC   0.050   0.035   0.050     490  0.0490    0.00
439          RX    0.00    6.00   10.00   12.00   12.10   15.00   17.00   21.00
440          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

441          KK   ON345   BASIN
442          BA   0.003
443          LG    0.35    0.40    6.00    0.18       0
```

```
          446          UA     100
                       *
1                                        HEC-1 INPUT                                        PAGE 13

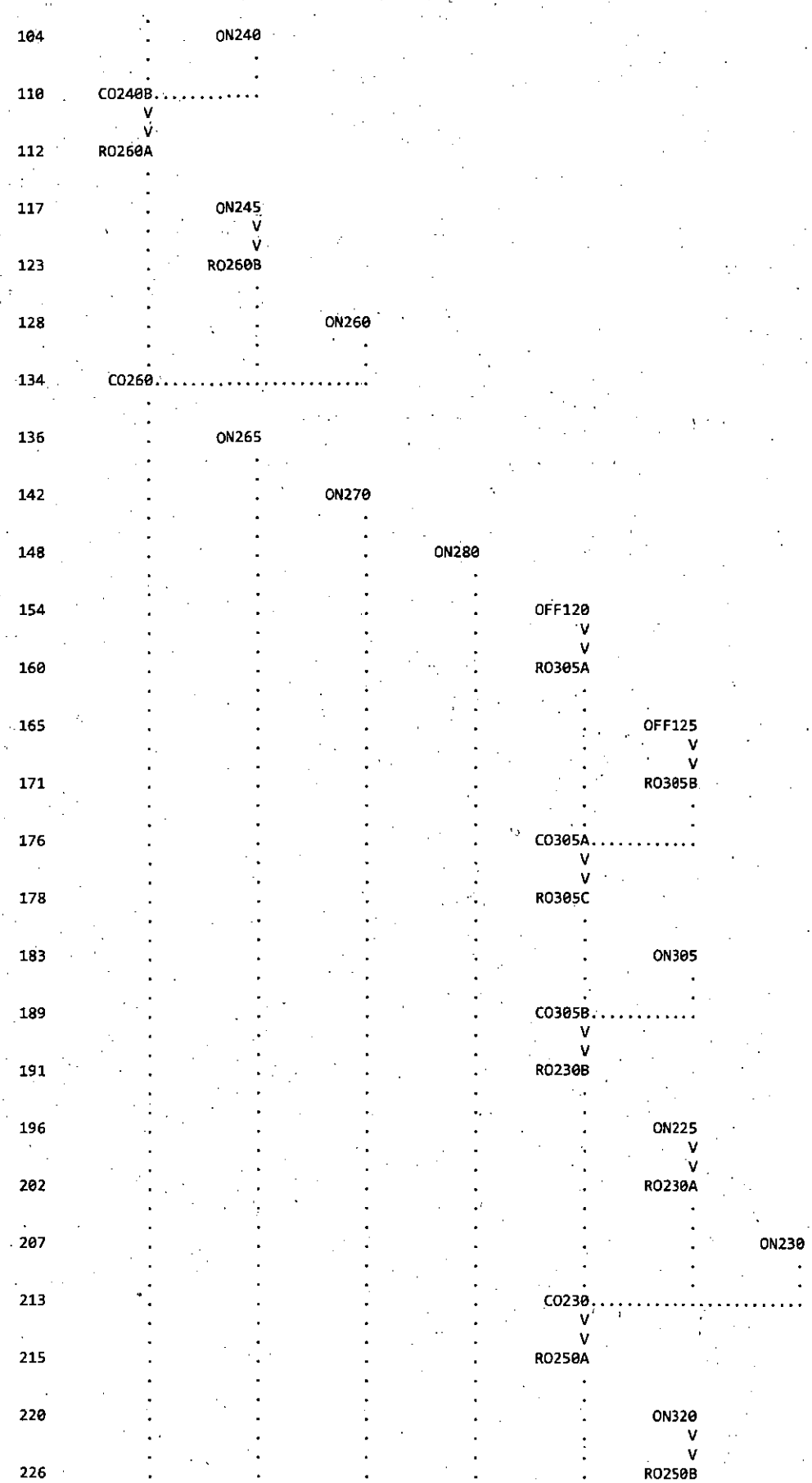
          LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

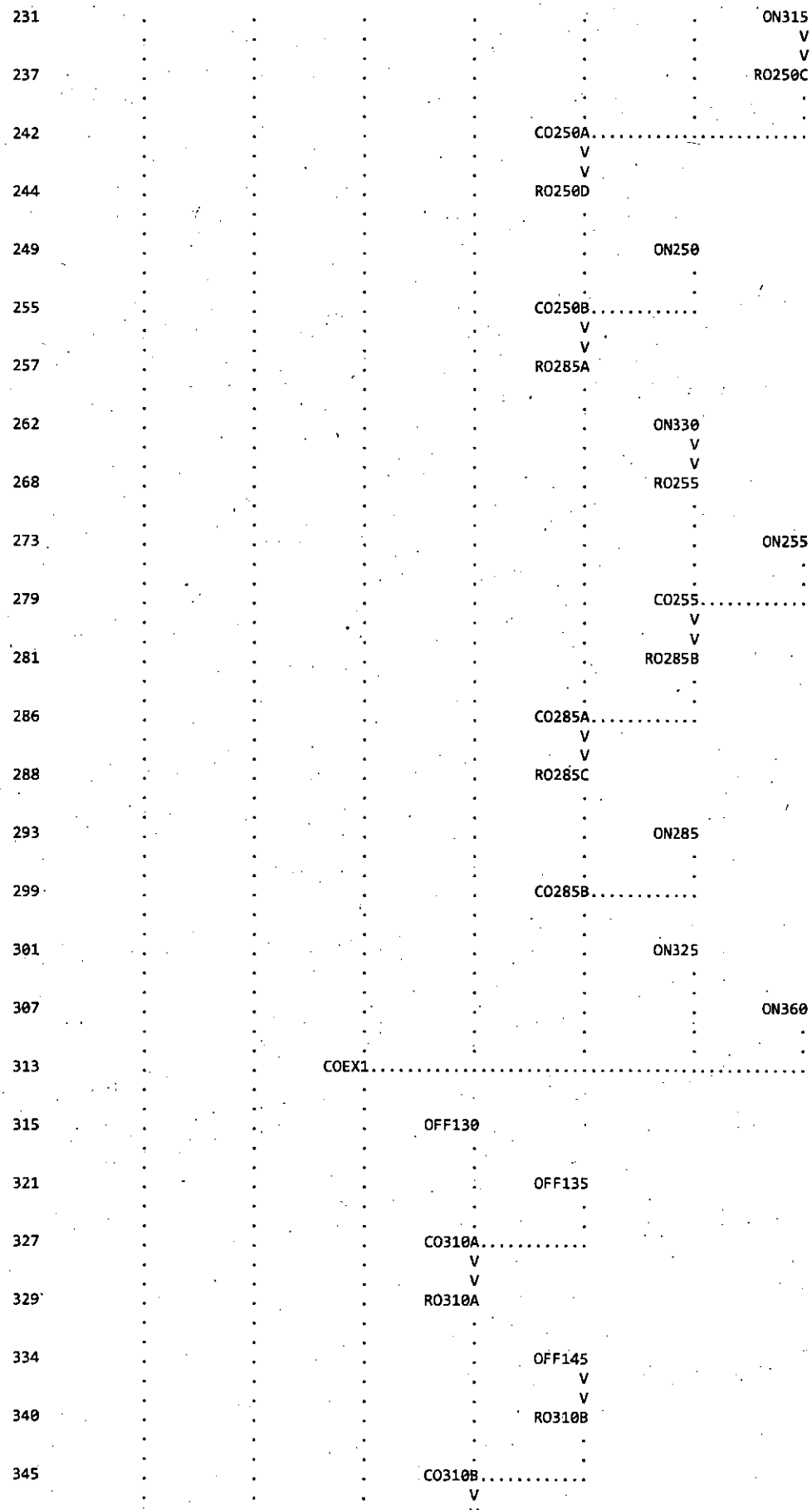

          447          KK   CO345 COMBINE
          448          HC       2
                       *

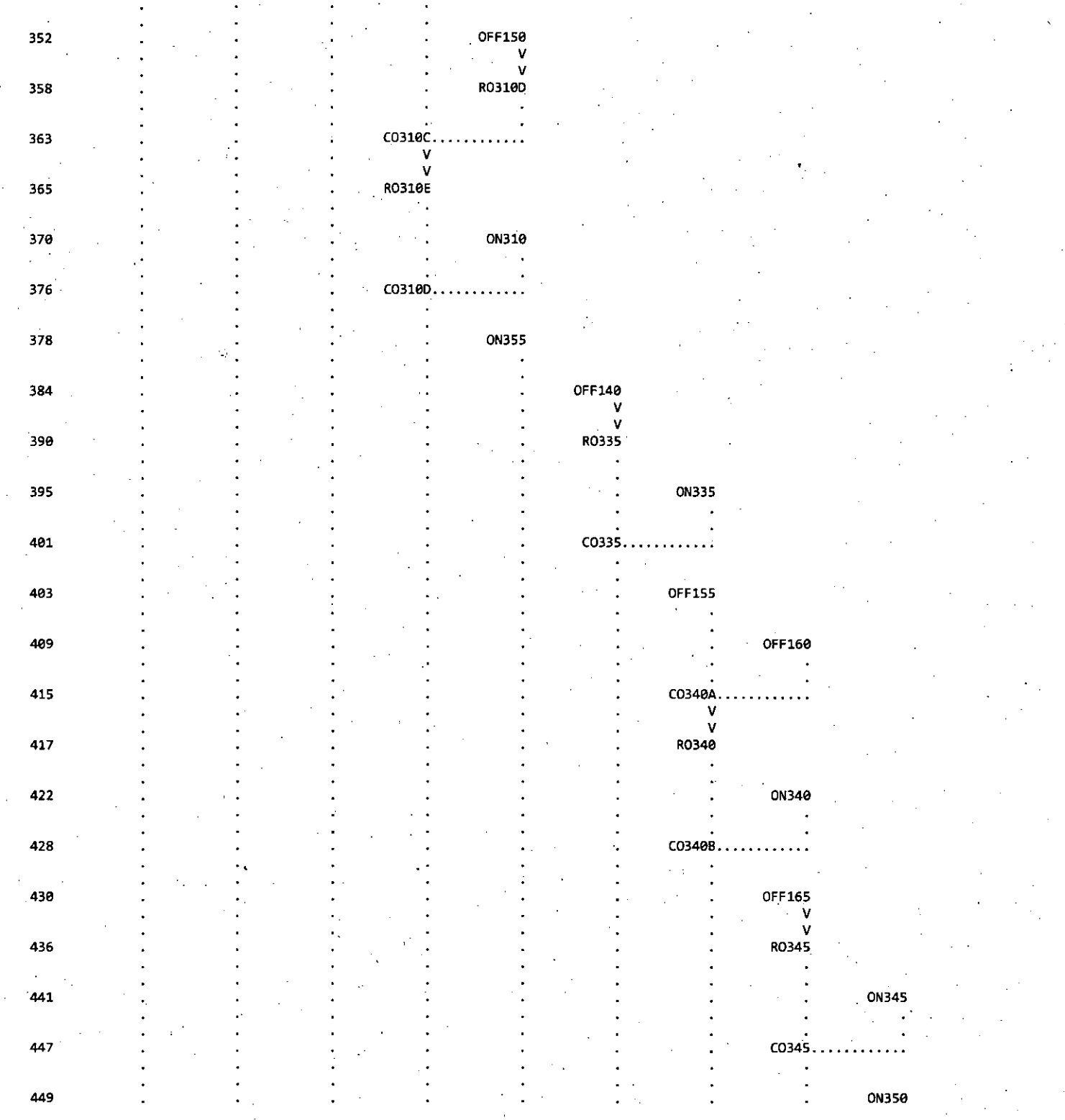
          449          KK   ON350   BASIN
          450          BA   0.001
          451          LG    0.35    0.40    6.00    0.18       0
          452          UC   0.103   0.160
          453          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          454          UA     100
                       *
          455          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<----) RETURN OF DIVERTED OR PUMPED FLOW

    23      OFF105
                 V
                 V
    29      RO215A
                 .
                 .
    34           .      OFF110
                 .           .
                 .           .
    40           .           .      OFF115
                 .           .           V
                 .           .           V
    46           .           .       RO220
                 .           .           .
                 .           .           .
    51           .           .           .       ON220
                 .           .           .           .
                 .           .           .           .
    57           .           .       CO220.............
                 .           .           V
                 .           .           V
    59           .           .      RO215D
                 .           .           .
                 .           .           .
    64           .      CO215A.............
                 .           V
                 .           V
    66           .      RO215B
                 .           .
                 .           .
    71      CO215B.............
                 V
                 V
    73      RO215C
                 .
                 .
    78           .      ON215
                 .           .
                 .           .
    84      CO215C.............
                 V
                 V
    86      RO240A
                 .
                 .
    91           .      ON235
                 .           .
                 .           .
    97      CO240A.............
                 V
                 V
```


104
ON240
110
CO240B
112
RO260A
117
ON245
123
RO260B
128
ON260
134
CO260
136
ON265
142
ON270
148
ON280
154
OFF120
160
RO305A
165
OFF125
171
RO305B
176
CO305A
178
RO305C
183
ON305
189
CO305B
191
RO230B
196
ON225
202
RO230A
207
ON230
213
CO230
215
RO250A
220
ON320
226
RO250B


231
ON315
237
RO250C
242
CO250A
244
RO250D
249
ON250
255
CO250B
257
RO285A
262
ON330
268
RO255
273
ON255
279
CO255
281
RO285B
286
CO285A
288
RO285C
293
ON285
299
CO285B
301
ON325
307
ON360
313
COEX1
315
OFF130
321
OFF135
327
CO310A
329
RO310A
334
OFF145
340
RO310B
345
CO310B



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1

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*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   27OCT16  TIME  22:31:33   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*            (916) 756-1104             *
*                                       *
*****************************************
```

Flood Control District of Maricopa County
STORYROCK PH3 EX - STORYROCK PHASE 3 EXISTING CONDITION
100 YEAR
6 Hour Storm
Unit Hydrograph: Clark
Storm: Multiple
10/27/2016

```
 9 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                    NMIN          5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1JAN99  STARTING DATE
                   ITIME        0000  STARTING TIME
                      NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      7JAN99  ENDING DATE
                  NDTIME        2235  ENDING TIME
                   ICENT          19  CENTURY MARK

             COMPUTATION INTERVAL    0.08 HOURS
                  TOTAL TIME BASE  166.58 HOURS

       ENGLISH UNITS
            DRAINAGE AREA         SQUARE MILES
            PRECIPITATION DEPTH   INCHES
            LENGTH, ELEVATION     FEET
            FLOW                  CUBIC FEET PER SECOND
            STORAGE VOLUME        ACRE-FEET
            SURFACE AREA          ACRES
            TEMPERATURE           DEGREES FAHRENHEIT

11 JD       INDEX STORM NO. 1
                   STRM       3.17  PRECIPITATION DEPTH
                   TRDA       0.00  TRANSPOSITION DRAINAGE AREA

12 PI         PRECIPITATION PATTERN
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.01  0.01  0.01  0.01  0.01  0.01  0.03
              0.03  0.03  0.05  0.05  0.05  0.15  0.15  0.15  0.03  0.03
              0.03  0.01  0.01  0.01  0.01  0.01  0.01  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00

15 JD       INDEX STORM NO. 2
                   STRM       3.15  PRECIPITATION DEPTH
                   TRDA       0.50  TRANSPOSITION DRAINAGE AREA

16 PI         PRECIPITATION PATTERN
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.01  0.01  0.01  0.01  0.01  0.01  0.03
              0.03  0.03  0.05  0.05  0.05  0.15  0.15  0.15  0.03  0.03
              0.03  0.01  0.01  0.01  0.01  0.01  0.01  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00

19 JD       INDEX STORM NO. 3
                   STRM       3.10  PRECIPITATION DEPTH
                   TRDA       2.80  TRANSPOSITION DRAINAGE AREA

20 PI         PRECIPITATION PATTERN
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
              0.00  0.00  0.00  0.01  0.01  0.01  0.01  0.01  0.01  0.03
              0.03  0.03  0.07  0.07  0.07  0.08  0.08  0.08  0.05  0.05
              0.05  0.02  0.02  0.02  0.01  0.01  0.01  0.00  0.00  0.00
              0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	OFF105	122.	4.25	14.	4.	1.	0.09		
+	ROUTED TO	RO215A	116.	4.25	14.	4.	1.	0.09		
+	HYDROGRAPH AT	OFF110	58.	4.17	6.	2.	1.	0.04		
+	HYDROGRAPH AT	OFF115	17.	4.08	1.	0.	0.	0.01		
+	ROUTED TO	RO220	17.	4.08	1.	0.	0.	0.01		
+	HYDROGRAPH AT	ON220	7.	4.08	1.	0.	0.	0.00		
+	2 COMBINED AT	CO220	24.	4.08	2.	0.	0.	0.01		
+	ROUTED TO	RO215D	24.	4.08	2.	0.	0.	0.01		
+	2 COMBINED AT	CO215A	79.	4.17	8.	2.	1.	0.05		
+	ROUTED TO	RO215B	77.	4.17	8.	2.	1.	0.05		
+	2 COMBINED AT	CO215B	190.	4.25	22.	5.	2.	0.13		
+	ROUTED TO	RO215C	189.	4.25	22.	5.	2.	0.13		
+	HYDROGRAPH AT	ON215	64.	4.08	5.	1.	0.	0.03		
+	2 COMBINED AT	CO215C	233.	4.25	27.	7.	2.	0.16		
+	ROUTED TO	RO240A	233.	4.25	27.	7.	2.	0.16		
+	HYDROGRAPH AT	ON235	5.	4.00	0.	0.	0.	0.00		
+	2 COMBINED AT	CO240A	235.	4.25	27.	7.	2.	0.16		
+	ROUTED TO	RO240B	236.	4.25	27.	7.	2.	0.16		
+	HYDROGRAPH AT	ON240	15.	4.08	1.	0.	0.	0.01		
+	2 COMBINED AT	CO240B	245.	4.25	28.	7.	2.	0.17		
+	ROUTED TO	RO260A	244.	4.25	28.	7.	2.	0.17		
+	HYDROGRAPH AT	ON245	6.	4.08	1.	0.	0.	0.00		
+	ROUTED TO	RO260B	6.	4.08	1.	0.	0.	0.00		

+	3 COMBINED AT CO260	251.	4.25	29.	7.	2.	0.18
+	HYDROGRAPH AT ON265	4.	4.08	0.	0.	0.	0.00
+	HYDROGRAPH AT ON270	5.	4.00	0.	0.	0.	0.00
+	HYDROGRAPH AT ON280	3.	4.00	0.	0.	0.	0.00
+	HYDROGRAPH AT OFF120	121.	4.25	16.	4.	1.	0.09
+	ROUTED TO RO305A	119.	4.25	16.	4.	1.	0.09
+	HYDROGRAPH AT OFF125	132.	4.25	19.	5.	2.	0.11
+	ROUTED TO RO305B	129.	4.33	19.	5.	2.	0.11
+	2 COMBINED AT CO305A	247.	4.25	34.	9.	3.	0.20
+	ROUTED TO RO305C	247.	4.33	34.	9.	3.	0.20
+	HYDROGRAPH AT ON305	39.	4.08	4.	1.	0.	0.02
+	2 COMBINED AT CO305B	270.	4.33	38.	9.	3.	0.22
+	ROUTED TO RO230B	271.	4.33	38.	9.	3.	0.22
+	HYDROGRAPH AT ON225	12.	4.08	1.	0.	0.	0.00
+	ROUTED TO RO230A	11.	4.08	1.	0.	0.	0.00
+	HYDROGRAPH AT ON230	15.	4.08	1.	0.	0.	0.01
+	3 COMBINED AT CO230	283.	4.33	40.	10.	3.	0.24
+	ROUTED TO RO250A	285.	4.33	40.	10.	3.	0.24
+	HYDROGRAPH AT ON320	2.	4.00	0.	0.	0.	0.00
+	ROUTED TO RO250B	2.	4.08	0.	0.	0.	0.00
+	HYDROGRAPH AT ON315	27.	4.17	3.	1.	0.	0.02
+	ROUTED TO RO250C	27.	4.17	3.	1.	0.	0.02
+	3 COMBINED AT CO250A	305.	4.33	43.	11.	4.	0.25
+	ROUTED TO RO250D	307.	4.33	43.	11.	4.	0.25
+	HYDROGRAPH AT ON250	20.	4.08	2.	0.	0.	0.01
+	2 COMBINED AT CO250B	315.	4.33	44.	11.	4.	0.26

	ROUTED TO						
+	RO285A	316.	4.33	44.	11.	4.	0.26
	HYDROGRAPH AT						
+	ON330	2.	4.00	0.	0.	0.	0.00
	ROUTED TO						
+	RO255	2.	4.08	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	ON255	5.	4.00	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO255	7.	4.00	1.	0.	0.	0.00
	ROUTED TO						
+	RO285B	7.	4.08	1.	0.	0.	0.00
	2 COMBINED AT						
+	CO285A	319.	4.33	45.	11.	4.	0.27
	ROUTED TO						
+	RO285C	320.	4.33	45.	11.	4.	0.27
	HYDROGRAPH AT						
+	ON285	20.	4.08	2.	0.	0.	0.01
	2 COMBINED AT						
+	CO285B	328.	4.33	46.	12.	4.	0.27
	HYDROGRAPH AT						
+	ON325	22.	4.17	3.	1.	0.	0.02
	HYDROGRAPH AT						
+	ON360	5.	4.00	0.	0.	0.	0.00
	5 COMBINED AT						
+	COEX1	349.	4.33	50.	12.	4.	0.30
	HYDROGRAPH AT						
+	OFF130	39.	4.08	3.	1.	0.	0.02
	HYDROGRAPH AT						
+	OFF135	61.	4.25	9.	2.	1.	0.06
	2 COMBINED AT						
+	CO310A	90.	4.17	12.	3.	1.	0.08
	ROUTED TO						
+	RO310A	88.	4.25	12.	3.	1.	0.08
	HYDROGRAPH AT						
+	OFF145	9.	4.08	1.	0.	0.	0.00
	ROUTED TO						
+	RO310B	8.	4.08	1.	0.	0.	0.00
	2 COMBINED AT						
+	CO310B	94.	4.17	13.	3.	1.	0.08
	ROUTED TO						
+	RO310C	95.	4.25	13.	3.	1.	0.08
	HYDROGRAPH AT						
+	OFF150	8.	4.08	1.	0.	0.	0.00
	ROUTED TO						
+	RO310D	8.	4.17	1.	0.	0.	0.00
	2 COMBINED AT						
+	CO310C	102.	4.25	14.	3.	1.	0.08
	ROUTED TO						
+	RO310E	102.	4.25	14.	3.	1.	0.08
	HYDROGRAPH AT						
+	ON310	57.	4.17	6.	2.	1.	0.04

+	CO310D	156.	4.25	20.	5.	2.	0.12
HYDROGRAPH AT							
+	ON355	6.	4.00	0.	0.	0.	0.00
HYDROGRAPH AT							
+	OFF140	57.	4.17	6.	1.	0.	0.04
ROUTED TO							
+	RO335	54.	4.25	6.	1.	0.	0.04
HYDROGRAPH AT							
+	ON335	27.	4.17	3.	1.	0.	0.02
2 COMBINED AT							
+	CO335	80.	4.17	8.	2.	1.	0.05
HYDROGRAPH AT							
+	OFF155	8.	4.08	1.	0.	0.	0.00
HYDROGRAPH AT							
+	OFF160	42.	4.25	6.	1.	0.	0.04
2 COMBINED AT							
+	CO340A	47.	4.17	6.	2.	1.	0.04
ROUTED TO							
+	RO340	48.	4.25	6.	2.	1.	0.04
HYDROGRAPH AT							
+	ON340	13.	4.08	1.	0.	0.	0.01
2 COMBINED AT							
+	CO340B	59.	4.17	8.	2.	1.	0.05
HYDROGRAPH AT							
+	OFF165	8.	4.00	1.	0.	0.	0.00
ROUTED TO							
+	RO345	8.	4.00	1.	0.	0.	0.00
HYDROGRAPH AT							
+	ON345	6.	4.08	1.	0.	0.	0.00
2 COMBINED AT							
+	CO345	13.	4.08	1.	0.	0.	0.01
HYDROGRAPH AT							
+	ON350	2.	4.00	0.	0.	0.	0.00

*** NORMAL END OF HEC-1 ***

Proposed Condition

Area ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	Rainfall Losses: IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period Parameters: 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
OFF105	0.085	0.87	275.2	253.3	NATURAL	0.056	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.538	0.501	0.447	0.393	0.361	0.336
												Vel (f/s)	2.37	2.55	2.85	3.25	3.53	3.80
												R (Hrs)	0.678	0.627	0.552	0.479	0.436	0.402
OFF110	0.037	0.56	470.3	299.0	NATURAL	0.061	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.428	0.399	0.356	0.313	0.288*	0.268 *
												Vel (f/s)	1.92	2.06	2.31	2.62	2.85	3.06
												R (Hrs)	0.595	0.550	0.484	0.420	0.382	0.353
OFF115	0.007	0.13	375.0	283.6	NATURAL	0.071	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.227*	0.211*	0.189*	0.166*	0.152*	0.142 *
												Vel (f/s)	0.84	0.90	1.01	1.15	1.25	1.34
												R (Hrs)	0.236	0.218	0.192	0.167	0.152	0.140
OFF120	0.095	1.12	628.7	313.0	NATURAL	0.055	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.566	0.528	0.470	0.414	0.380	0.354
												Vel (f/s)	2.90	3.11	3.50	3.97	4.32	4.64
												R (Hrs)	0.825	0.762	0.671	0.583	0.530	0.489
OFF125	0.109	1.26	773.1	313.0	NATURAL	0.055	0.35	0.40	6.00	0.176	2	**Tc (Hrs)**	0.594	0.554	0.495	0.437	0.402	0.374
												Vel (f/s)	3.11	3.34	3.73	4.23	4.60	4.94
												R (Hrs)	0.883	0.817	0.722	0.628	0.572	0.528
OFF130	0.018	0.27	531.4	306.3	NATURAL	0.065	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.305	0.284*	0.253*	0.223*	0.205*	0.191 *
												Vel (f/s)	1.30	1.39	1.57	1.78	1.93	2.07
												R (Hrs)	0.343	0.317	0.279	0.242	0.221	0.204
OFF135	0.057	1.04	424.9	292.7	NATURAL	0.059	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.578	0.538	0.480	0.422	0.388	0.361
												Vel (f/s)	2.64	2.84	3.18	3.61	3.93	4.23
												R (Hrs)	1.063	0.983	0.865	0.751	0.683	0.630
OFF140	0.035	0.52	345.0	276.7	NATURAL	0.061	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.423	0.394	0.351	0.309	0.284*	0.264 *
												Vel (f/s)	1.80	1.94	2.17	2.47	2.69	2.89
												R (Hrs)	0.570	0.527	0.464	0.403	0.366	0.338
OFF145	0.004	0.13	395.5	287.7	NATURAL	0.074	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.231*	0.215*	0.192*	0.169*	0.155*	0.144 *
												Vel (f/s)	0.83	0.89	0.99	1.13	1.23	1.32
												R (Hrs)	0.331	0.306	0.269	0.234	0.213	0.196

* Non default value or value out of range

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: STORYROCK PH3 PROP

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
OFF150	0.004	0.14	321.2	270.3	NATURAL	0.074	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.244*	0.228*	0.203*	0.179*	0.164*	0.153 *
												Vel (f/s)	0.84	0.90	1.01	1.15	1.25	1.34
												R (Hrs)	0.374	0.345	0.304	0.264	0.240	0.222
OFF155	0.004	0.16	367.1	281.9	NATURAL	0.074	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.258*	0.240*	0.214*	0.189*	0.173*	0.161 *
												Vel (f/s)	0.91	0.98	1.10	1.24	1.36	1.46
												R (Hrs)	0.441	0.408	0.359	0.312	0.284	0.262
OFF160	0.035	0.74	357.2	279.7	NATURAL	0.061	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.503	0.468	0.418	0.368	0.338	0.314
												Vel (f/s)	2.16	2.32	2.60	2.95	3.21	3.46
												R (Hrs)	0.916	0.847	0.746	0.647	0.589	0.543
OFF165	0.003	0.08	444.4	295.6	NATURAL	0.076	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.182*	0.170*	0.151*	0.133*	0.122*	0.114 *
												Vel (f/s)	0.64	0.69	0.78	0.88	0.96	1.03
												R (Hrs)	0.203	0.188	0.165	0.143	0.131	0.120
ON215	0.030	0.32	251.6	240.8	NATURAL	0.062	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.349	0.325	0.290*	0.255*	0.235*	0.218 *
												Vel (f/s)	1.34	1.44	1.62	1.84	2.00	2.15
												R (Hrs)	0.341	0.316	0.278	0.241	0.219	0.202
ON200	0.006	0.15	335.6	274.3	NATURAL	0.072	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.248*	0.231*	0.206*	0.181*	0.167*	0.155 *
												Vel (f/s)	0.89	0.95	1.07	1.22	1.32	1.42
												R (Hrs)	0.319	0.295	0.260	0.225	0.205	0.189
ON205	0.021	0.33	231.0	226.9	NATURAL	0.057	0.32	0.36	6.00	0.186	9	**Tc (Hrs)**	0.324	0.305	0.275*	0.244*	0.226*	0.211 *
												Vel (f/s)	1.49	1.59	1.76	1.98	2.14	2.29
												R (Hrs)	0.394	0.369	0.329	0.289	0.265	0.246
ON210	0.016	0.36	203.9	203.7	NATURAL	0.066	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.403	0.375	0.335	0.295*	0.271*	0.252 *
												Vel (f/s)	1.31	1.41	1.58	1.79	1.95	2.10
												R (Hrs)	0.629	0.582	0.512	0.445	0.404	0.373
ON220	0.002	0.11	293.6	261.0	NATURAL	0.039	0.30	0.25	6.00	0.167	17	**Tc (Hrs)**	0.135*	0.128*	0.116*	0.104*	0.098*	0.092 *
												Vel (f/s)	1.20	1.26	1.39	1.55	1.65	1.75
												R (Hrs)	0.237	0.224	0.200	0.178	0.165	0.155

* Non default value or value out of range

Area ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	Rainfall Losses: IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period Parameters: 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
ON225	0.005	0.14	230.8	226.8	NATURAL	0.037	0.30	0.25	6.00	0.186	19	**Tc (Hrs)**	0.156*	0.148*	0.134*	0.120*	0.112*	0.106 *
												Vel (f/s)	1.32	1.39	1.53	1.71	1.83	1.94
												R (Hrs)	0.199	0.188	0.169	0.150	0.139	0.130
ON230	0.007	0.16	208.6	208.1	NATURAL	0.071	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.277*	0.258*	0.230*	0.203*	0.186*	0.173 *
												Vel (f/s)	0.85	0.91	1.02	1.16	1.26	1.36
												R (Hrs)	0.348	0.321	0.283	0.246	0.224	0.206
ON235	0.002	0.07	369.9	282.5	NATURAL	0.079	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.176*	0.164*	0.146*	0.129*	0.118*	0.110 *
												Vel (f/s)	0.58	0.63	0.70	0.80	0.87	0.93
												R (Hrs)	0.222	0.205	0.181	0.157	0.143	0.132
ON240	0.007	0.18	280.2	255.6	NATURAL	0.071	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.276*	0.257*	0.229*	0.202*	0.185*	0.172 *
												Vel (f/s)	0.96	1.03	1.15	1.31	1.43	1.53
												R (Hrs)	0.380	0.351	0.309	0.269	0.244	0.225
ON245	0.003	0.12	317.1	269.0	NATURAL	0.076	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.230*	0.214*	0.191*	0.168*	0.154*	0.143 *
												Vel (f/s)	0.77	0.82	0.92	1.05	1.14	1.23
												R (Hrs)	0.363	0.336	0.296	0.257	0.234	0.216
ON250	0.009	0.18	261.4	246.4	NATURAL	0.070	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.277*	0.258*	0.230*	0.203*	0.186*	0.173 *
												Vel (f/s)	0.95	1.02	1.15	1.30	1.42	1.53
												R (Hrs)	0.331	0.306	0.269	0.234	0.213	0.196
ON255	0.002	0.07	376.8	284.0	NATURAL	0.079	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.176*	0.164*	0.146*	0.129*	0.118*	0.110 *
												Vel (f/s)	0.58	0.63	0.70	0.80	0.87	0.93
												R (Hrs)	0.221	0.205	0.180	0.156	0.142	0.131
ON260	0.002	0.09	219.8	218.0	NATURAL	0.079	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.217*	0.202*	0.180*	0.158*	0.145*	0.135 *
												Vel (f/s)	0.61	0.65	0.73	0.84	0.91	0.98
												R (Hrs)	0.341	0.315	0.277	0.241	0.219	0.202
ON265	0.001	0.06	321.4	270.3	NATURAL	0.041	0.30	0.25	6.00	0.216	27	**Tc (Hrs)**	0.100*	0.095*	0.087*	0.079*	0.073*	0.069 *
												Vel (f/s)	0.88	0.93	1.01	1.11	1.21	1.28
												R (Hrs)	0.155	0.147	0.133	0.119	0.110	0.103

* Non default value or value out of range

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
ON270	0.004	0.16	222.9	220.6	NATURAL	0.037	0.30	0.25	6.00	0.216	27	**Tc (Hrs)**	0.165*	0.157*	0.144*	0.130*	0.121*	0.114 *
												Vel (f/s)	1.42	1.49	1.63	1.81	1.94	2.06
												R (Hrs)	0.269	0.255	0.231	0.206	0.191	0.179
ON280	0.001	0.04	170.7	170.7	NATURAL	0.041	0.30	0.25	6.00	0.216	27	**Tc (Hrs)**	0.094*	0.090*	0.082*	0.074*	0.069*	0.065 *
												Vel (f/s)	0.62	0.65	0.72	0.79	0.85	0.90
												R (Hrs)	0.105	0.099	0.090	0.080	0.075	0.070
ON285	0.009	0.18	268.2	249.9	NATURAL	0.048	0.32	0.31	6.00	0.170	11	**Tc (Hrs)**	0.205*	0.194*	0.175*	0.155*	0.145*	0.136 *
												Vel (f/s)	1.29	1.36	1.51	1.70	1.82	1.94
												R (Hrs)	0.237	0.222	0.198	0.174	0.161	0.150
ON305	0.023	0.33	271.9	251.8	NATURAL	0.041	0.30	0.29	6.00	0.182	15	**Tc (Hrs)**	0.250*	0.237*	0.215*	0.192*	0.179*	0.168 *
												Vel (f/s)	1.94	2.04	2.25	2.52	2.70	2.88
												R (Hrs)	0.281	0.265	0.237	0.209	0.193	0.181
ON310	0.018	0.48	242.7	235.2	NATURAL	0.039	0.31	0.28	6.00	0.183	15	**Tc (Hrs)**	0.300	0.284*	0.257*	0.230*	0.214*	0.202 *
												Vel (f/s)	2.35	2.48	2.74	3.06	3.29	3.49
												R (Hrs)	0.534	0.503	0.450	0.397	0.367	0.343
ON311	0.015	0.36	264.8	248.2	NATURAL	0.036	0.30	0.26	6.00	0.185	17	**Tc (Hrs)**	0.242*	0.229*	0.208*	0.186*	0.174*	0.164 *
												Vel (f/s)	2.18	2.31	2.54	2.84	3.03	3.22
												R (Hrs)	0.370	0.349	0.313	0.277	0.256	0.240
ON312	0.004	0.14	297.1	262.3	NATURAL	0.052	0.32	0.31	6.00	0.170	10	**Tc (Hrs)**	0.186*	0.176*	0.159*	0.141*	0.131*	0.123 *
												Vel (f/s)	1.10	1.17	1.29	1.46	1.57	1.67
												R (Hrs)	0.277	0.260	0.232	0.203	0.187	0.175
ON313	0.004	0.15	209.5	209.0	NATURAL	0.065	0.29	0.36	6.00	0.197	15	**Tc (Hrs)**	0.233*	0.220*	0.200*	0.179*	0.166*	0.155 *
												Vel (f/s)	0.94	1.00	1.10	1.23	1.33	1.42
												R (Hrs)	0.375	0.352	0.316	0.279	0.257	0.239
ON315	0.009	0.22	277.8	254.5	NATURAL	0.043	0.31	0.28	6.00	0.168	13	**Tc (Hrs)**	0.208*	0.197*	0.178*	0.159*	0.148*	0.140 *
												Vel (f/s)	1.55	1.64	1.81	2.03	2.18	2.30
												R (Hrs)	0.283	0.266	0.238	0.210	0.194	0.182

* Non default value or value out of range

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: STORYROCK PH3 PROP

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
ON320	0.001	0.05	177.8	177.8	NATURAL	0.083	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.176*	0.164*	0.147*	0.129*	0.119*	0.110*
												Vel (f/s)	0.42	0.45	0.50	0.57	0.62	0.67
												R (Hrs)	0.252	0.233	0.205	0.178	0.162	0.149
ON325	0.006	0.18	302.2	264.2	NATURAL	0.042	0.31	0.28	6.00	0.168	14	**Tc (Hrs)**	0.183*	0.174*	0.157*	0.140*	0.131*	0.123*
												Vel (f/s)	1.44	1.52	1.68	1.89	2.02	2.15
												R (Hrs)	0.264	0.248	0.222	0.196	0.181	0.170
ON326	0.007	0.21	179.6	179.6	NATURAL	0.046	0.31	0.29	6.00	0.170	12	**Tc (Hrs)**	0.237*	0.224*	0.202*	0.180*	0.168*	0.158*
												Vel (f/s)	1.30	1.38	1.52	1.71	1.83	1.95
												R (Hrs)	0.363	0.341	0.305	0.268	0.248	0.232
ON330	0.001	0.06	431.0	293.7	NATURAL	0.083	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.165*	0.154*	0.137*	0.121*	0.111*	0.103*
												Vel (f/s)	0.53	0.57	0.64	0.73	0.79	0.85
												R (Hrs)	0.271	0.251	0.221	0.192	0.174	0.161
ON335	0.002	0.17	369.0	282.3	NATURAL	0.059	0.33	0.33	6.00	0.171	9	**Tc (Hrs)**	0.217*	0.205*	0.185*	0.164*	0.152*	0.143*
												Vel (f/s)	1.15	1.22	1.35	1.52	1.64	1.74
												R (Hrs)	0.569	0.534	0.475	0.416	0.383	0.357
ON336	0.007	0.12	200.0	199.9	NATURAL	0.040	0.31	0.27	6.00	0.186	16	**Tc (Hrs)**	0.159*	0.151*	0.137*	0.122*	0.114*	0.107*
												Vel (f/s)	1.11	1.17	1.28	1.44	1.54	1.64
												R (Hrs)	0.149	0.140	0.126	0.111	0.103	0.096
ON337	0.009	0.28	149.5	149.5	NATURAL	0.039	0.31	0.27	6.00	0.183	17	**Tc (Hrs)**	0.261*	0.247*	0.224*	0.201*	0.187*	0.176*
												Vel (f/s)	1.57	1.66	1.83	2.04	2.20	2.33
												R (Hrs)	0.441	0.416	0.373	0.330	0.305	0.286
ON340	0.011	0.25	279.4	255.2	NATURAL	0.040	0.31	0.28	6.00	0.173	14	**Tc (Hrs)**	0.214*	0.202*	0.183*	0.163*	0.152*	0.143*
												Vel (f/s)	1.71	1.82	2.00	2.25	2.41	2.56
												R (Hrs)	0.288	0.271	0.242	0.213	0.197	0.185
ON345	0.002	0.14	362.3	280.8	NATURAL	0.079	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.250*	0.233*	0.207*	0.183*	0.168*	0.156*
												Vel (f/s)	0.82	0.88	0.99	1.12	1.22	1.32
												R (Hrs)	0.569	0.526	0.463	0.402	0.366	0.337

* Non default value or value out of range

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
ON350	0.001	0.06	472.7	299.3	NATURAL	0.062	0.33	0.33	6.00	0.171	9	**Tc (Hrs)**	0.130*	0.123*	0.111*	0.098*	0.091*	0.085 *
												Vel (f/s)	0.68	0.72	0.79	0.90	0.97	1.04
												R (Hrs)	0.208	0.195	0.174	0.152	0.140	0.130
ON355	0.001	0.05	234.0	229.2	NATURAL	0.041	0.30	0.25	6.00	0.167	17	**Tc (Hrs)**	0.097*	0.092*	0.084*	0.075*	0.070*	0.066 *
												Vel (f/s)	0.76	0.80	0.87	0.98	1.05	1.11
												R (Hrs)	0.130	0.123	0.110	0.098	0.091	0.085
ON360	0.001	0.06	806.5	313.0	NATURAL	0.083	0.35	0.40	6.00	0.176		**Tc (Hrs)**	0.162*	0.151*	0.135*	0.119*	0.109*	0.101 *
												Vel (f/s)	0.54	0.58	0.65	0.74	0.81	0.87
												R (Hrs)	0.265	0.245	0.216	0.188	0.171	0.157

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 PROP

in	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
or Basin ID: 01									
105	DESERT	0.0851	100.0	0.35	0	25.0	DRY	0.056	Desert
		0.0851	**100.0**						
110	DESERT	0.0369	100.0	0.35	0	25.0	DRY	0.061	Desert
		0.0369	**100.0**						
115	DESERT	0.0065	100.0	0.35	0	25.0	DRY	0.071	Desert
		0.0065	**100.0**						
120	DESERT	0.0950	100.0	0.35	0	25.0	DRY	0.055	Desert
		0.0950	**100.0**						
125	DESERT	0.1094	100.0	0.35	0	25.0	DRY	0.055	Desert
		0.1094	**100.0**						
130	DESERT	0.0180	100.0	0.35	0	25.0	DRY	0.065	Desert
		0.0180	**100.0**						
135	DESERT	0.0569	100.0	0.35	0	25.0	DRY	0.059	Desert
		0.0569	**100.0**						
140	DESERT	0.0347	100.0	0.35	0	25.0	DRY	0.061	Desert
		0.0347	**100.0**						
145	DESERT	0.0044	100.0	0.35	0	25.0	DRY	0.074	Desert
		0.0044	**100.0**						
150	DESERT	0.0035	100.0	0.35	0	25.0	DRY	0.074	Desert
		0.0035	**100.0**						
155	DESERT	0.0041	100.0	0.35	0	25.0	DRY	0.074	Desert

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 PROP

n	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
or Basin ID: 01									
		0.0010	**100.0**						
85	DESERT	0.0030	37.5	0.35	0	25.0	DRY	0.070	Desert
	R1-43	0.0050	62.5	0.30	17	20.0	NORMAL	0.035	Residential 43,000 sq-ft lots
		0.0080	**100.0**						
05	DESERT	0.0060	26.1	0.35	0	25.0	DRY	0.064	Desert
	R1-35	0.0040	17.4	0.30	21	50.0	NORMAL	0.033	Residential 35,000 sq-ft lots
	R1-43	0.0120	52.2	0.30	17	20.0	NORMAL	0.033	Residential 43,000 sq-ft lots
	ROAD	0.0010	4.3	0.10	60	75.0	NORMAL	0.033	Local Roadway 40' Tract 24' BC
		0.0230	**100.0**						
10	DESERT	0.0030	17.6	0.35	0	25.0	DRY	0.065	Desert
	R1-35	0.0050	29.4	0.30	21	50.0	NORMAL	0.033	Residential 35,000 sq-ft lots
	R1-43	0.0090	52.9	0.30	17	20.0	NORMAL	0.033	Residential 43,000 sq-ft lots
		0.0170	**99.9**						
11	DESERT	0.0010	6.7	0.35	0	25.0	DRY	0.066	Desert
	R1-35	0.0050	33.3	0.30	21	50.0	NORMAL	0.034	Residential 35,000 sq-ft lots
	R1-43	0.0090	60.0	0.30	17	20.0	NORMAL	0.034	Residential 43,000 sq-ft lots
		0.0150	**100.0**						
12	DESERT	0.0020	40.0	0.35	0	25.0	DRY	0.074	Desert
	R1-43	0.0030	60.0	0.30	17	20.0	NORMAL	0.037	Residential 43,000 sq-ft lots
		0.0050	**100.0**						
13	DESERT	0.0030	75.0	0.35	0	25.0	DRY	0.074	Desert

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 PROP

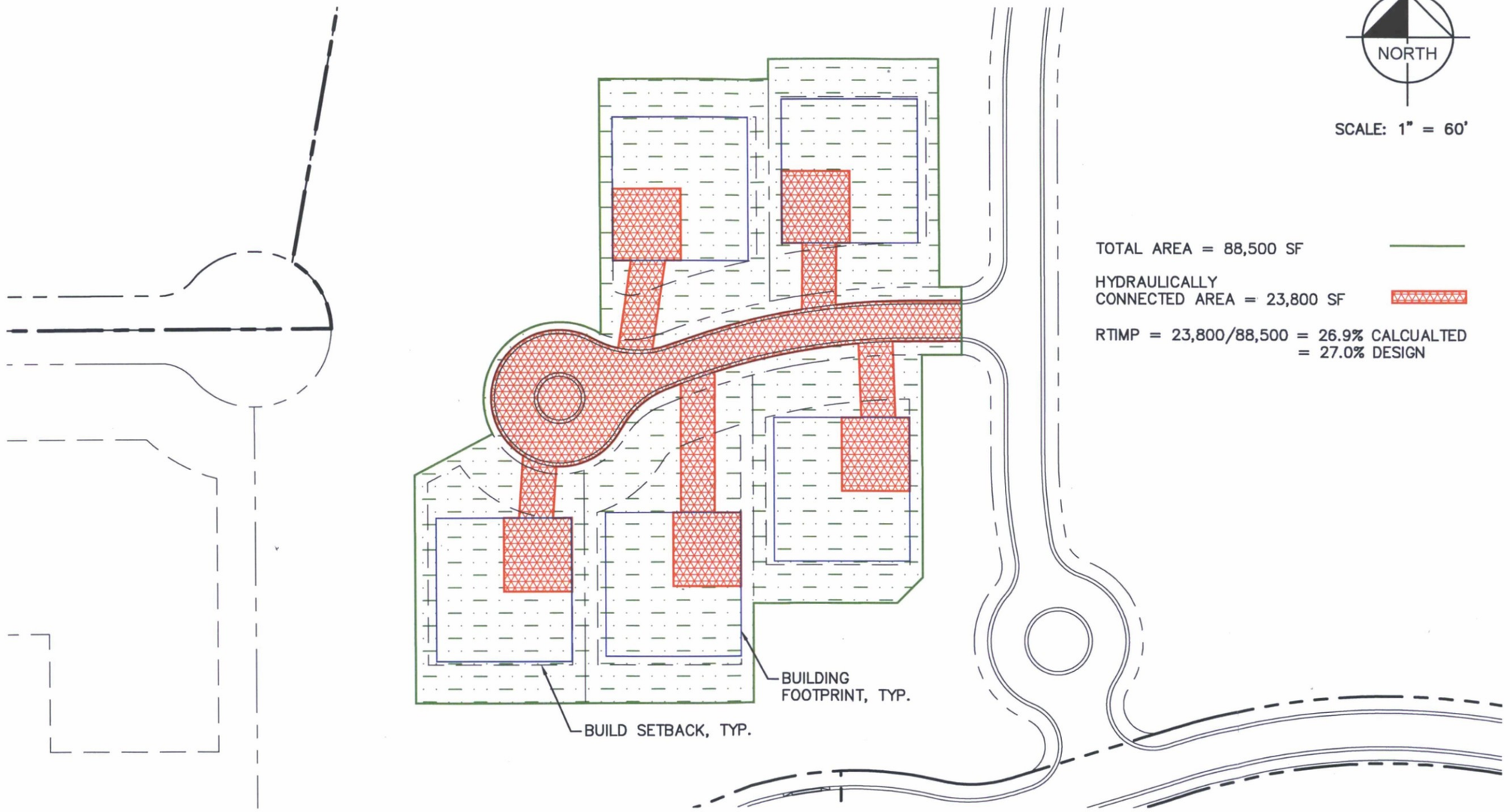
n	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
or Basin ID: 01									
	ROAD	0.0010	25.0	0.10	60	75.0	NORMAL	0.037	Local Roadway 40' Tract 24' BC
		0.0040	**100.0**						
15	DESERT	0.0020	22.2	0.35	0	25.0	DRY	0.070	Desert
	R1-43	0.0070	77.8	0.30	17	20.0	NORMAL	0.035	Residential 43,000 sq-ft lots
		0.0090	**100.0**						
20	DESERT	0.0010	100.0	0.35	0	25.0	DRY	0.083	Desert
		0.0010	**100.0**						
25	DESERT	0.0010	16.7	0.35	0	25.0	DRY	0.072	Desert
	R1-43	0.0050	83.3	0.30	17	20.0	NORMAL	0.036	Residential 43,000 sq-ft lots
		0.0060	**100.0**						
26	DESERT	0.0020	28.6	0.35	0	25.0	DRY	0.071	Desert
	R1-43	0.0050	71.4	0.30	17	20.0	NORMAL	0.036	Residential 43,000 sq-ft lots
		0.0070	**100.0**						
30	DESERT	0.0010	100.0	0.35	0	25.0	DRY	0.083	Desert
		0.0010	**100.0**						
35	DESERT	0.0010	50.0	0.35	0	25.0	DRY	0.079	Desert
	R1-43	0.0010	50.0	0.30	17	20.0	NORMAL	0.039	Residential 43,000 sq-ft lots
		0.0020	**100.0**						
36	DESERT	0.0010	12.5	0.35	0	25.0	DRY	0.071	Desert
	R1-35	0.0030	37.5	0.30	21	50.0	NORMAL	0.036	Residential 35,000 sq-ft lots

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: STORYROCK PH3 PROP

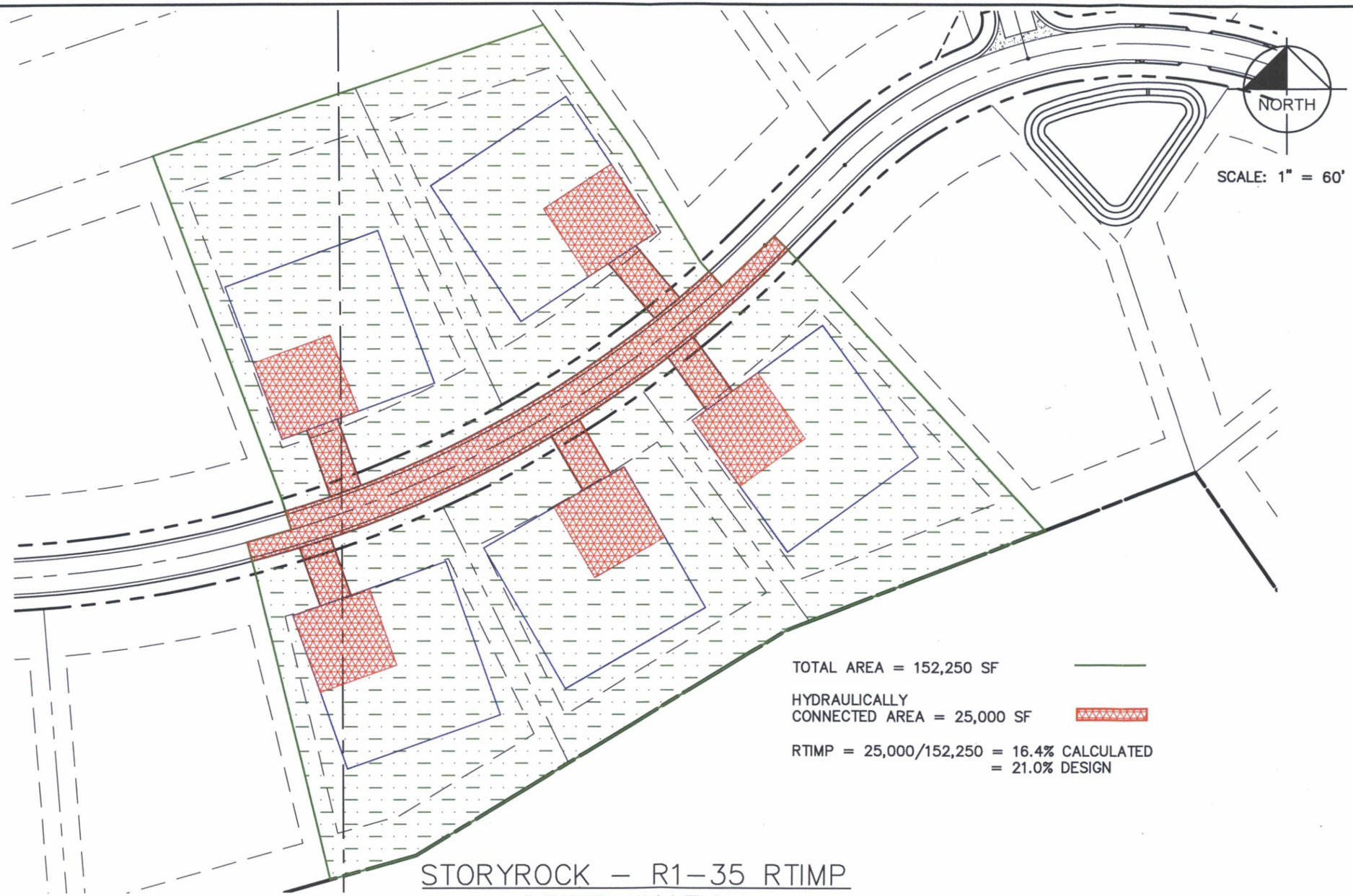
n	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
or Basin ID: 01									
36	R1-43	0.0040	50.0	0.30	17	20.0	NORMAL	0.036	Residential 43,000 sq-ft lots
		0.0080	**100.0**						
37	DESERT	0.0010	10.0	0.35	0	25.0	DRY	0.070	Desert
	R1-35	0.0030	30.0	0.30	21	50.0	NORMAL	0.035	Residential 35,000 sq-ft lots
	R1-43	0.0060	60.0	0.30	17	20.0	NORMAL	0.035	Residential 43,000 sq-ft lots
		0.0100	**100.0**						
40	DESERT	0.0020	16.7	0.35	0	25.0	DRY	0.068	Desert
	R1-35	0.0010	8.3	0.30	21	50.0	NORMAL	0.035	Residential 35,000 sq-ft lots
	R1-43	0.0090	75.0	0.30	17	20.0	NORMAL	0.035	Residential 43,000 sq-ft lots
		0.0120	**100.0**						
45	DESERT	0.0010	100.0	0.35	0	25.0	DRY	0.079	Desert
		0.0010	**100.0**						
50	DESERT	0.0010	50.0	0.35	0	25.0	DRY	0.083	Desert
	R1-43	0.0010	50.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0020	**100.0**						
55	R1-43	0.0010	100.0	0.30	17	20.0	NORMAL	0.041	Residential 43,000 sq-ft lots
		0.0010	**100.0**						
60	DESERT	0.0010	100.0	0.35	0	25.0	DRY	0.083	Desert
		0.0010	**100.0**						

* Non default value



STORYROCK – R1–18 RTIMP DETERMINATION

Kimley»Horn



STORYROCK – R1–35 RTIMP
DETERMINATION

Kimley»Horn

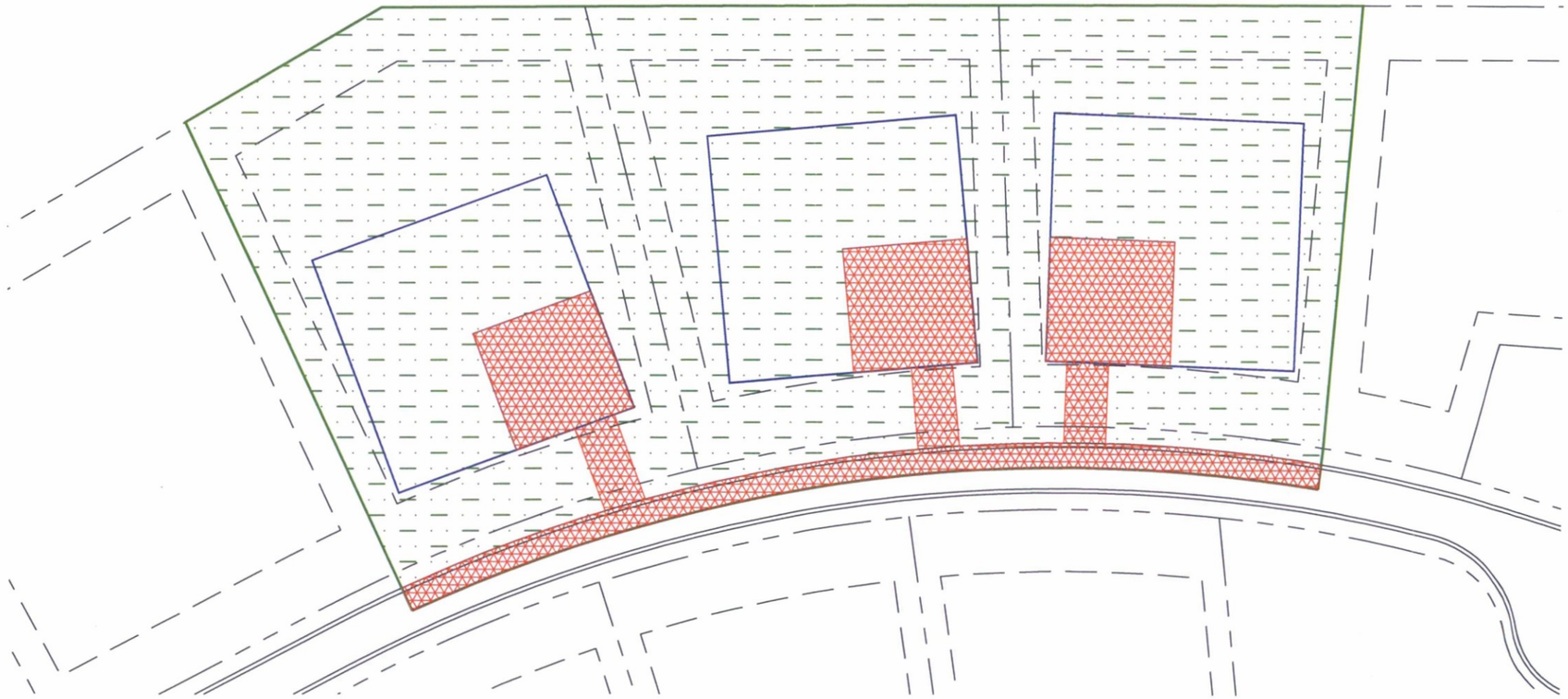
NORTH

SCALE: 1" = 60'

TOTAL AREA = 123,750 SF

HYDRAULICALLY
CONNECTED AREA = 19,000 SF

RTIMP = 19,000/123,750 = 15.4% CALCULATED
17.0% DESIGN



STORYROCK – R1–43 RTIMP
DETERMINATION

Kimley»Horn

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
OFF105	645	61	64561	0.085	100.00	0.150	-	100	
OFF110	645	61	64561	0.037	100.00	0.150	-	100	
OFF115	645	61	64561	0.007	100.00	0.150	-	100	
OFF120	645	61	64561	0.094	99.20	0.150	-	100	
	645	63	64563	0.001	0.80	0.140	25.00	100	
OFF125	645	61	64561	0.100	91.60	0.150	-	100	
	645	63	64563	0.009	8.40	0.140	25.00	100	
OFF130	645	61	64561	0.018	100.00	0.150	-	100	
OFF135	645	61	64561	0.056	98.40	0.150	-	100	
	645	63	64563	0.001	1.60	0.140	25.00	100	
OFF140	645	61	64561	0.035	100.00	0.150	-	100	
OFF145	645	61	64561	0.004	100.00	0.150	-	100	
OFF150	645	61	64561	0.004	100.00	0.150	-	100	
OFF155	645	61	64561	0.004	100.00	0.150	-	100	
OFF160	645	61	64561	0.035	100.00	0.150	-	100	
OFF165	645	61	64561	0.003	100.00	0.150	-	100	
ON200	645	61	64561	0.006	100.00	0.150	-	100	
ON205	645	61	64561	0.021	100.00	0.150	-	100	
ON210	645	61	64561	0.016	100.00	0.150	-	100	
ON215	645	61	64561	0.030	100.00	0.150	-	100	
ON220	645	61	64561	0.002	100.00	0.150	-	100	
ON225	645	61	64561	0.005	100.00	0.150	-	100	
ON230	645	61	64561	0.007	100.00	0.150	-	100	
ON235	645	61	64561	0.002	100.00	0.150	-	100	
ON240	645	61	64561	0.007	100.00	0.150	-	100	
ON245	645	61	64561	0.003	100.00	0.150	-	100	
ON250	645	61	64561	0.009	100.00	0.150	-	100	
ON255	645	61	64561	0.002	100.00	0.150	-	100	
ON260	645	61	64561	0.002	100.00	0.150	-	100	
ON265	645	61	64561	0.001	100.00	0.150	-	100	
ON270	645	61	64561	0.004	100.00	0.150	-	100	
ON280	645	61	64561	0.001	100.00	0.150	-	100	
ON285	645	61	64561	0.009	100.00	0.150	-	100	
ON305	645	61	64561	0.023	100.00	0.150	-	100	
ON310	645	61	64561	0.018	100.00	0.150	-	100	
ON311	645	61	64561	0.015	100.00	0.150	-	100	
ON312	645	61	64561	0.004	100.00	0.150	-	100	
ON313	645	61	64561	0.004	100.00	0.150	-	100	
ON315	645	61	64561	0.009	100.00	0.150	-	100	
ON320	645	61	64561	0.001	100.00	0.150	-	100	
ON325	645	61	64561	0.006	100.00	0.150	-	100	
ON326	645	61	64561	0.007	100.00	0.150	-	100	
ON330	645	61	64561	0.001	100.00	0.150	-	100	
ON335	645	61	64561	0.002	100.00	0.150	-	100	
ON336	645	61	64561	0.007	100.00	0.150	-	100	
ON337	645	61	64561	0.009	100.00	0.150	-	100	
ON340	645	61	64561	0.011	100.00	0.150	-	100	
ON345	645	61	64561	0.002	100.00	0.150	-	100	

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Engineering, Planning and Environmental Consultants

7740 North 16th Street, Suite 300
Phoenix, Arizona 85020 (602) 944-5500

NO	REVISION	BY	DATE	APPR.

SCALE(H): 1" = 1800'
SCALE(V): N/A
DESIGNED BY: MAW
DRAWN BY: DWT
CHECKED BY: MAW
DATE: AUGUST 2014

CAVALLIERE
EXISTING SOILS MAP

PROJECT NO.
191069013

DRAWING NAME
Existing_Soils.mxd

Kimley»Horn

Project ***Storyrock Phase 3A***
Subject **Detention Basin Calculations**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: to determine the storage-flow relationship for small detention basins

DB225 ***Drains in 2.46 hours***

Outlet Diameter	1.00 ft	Outlet X-Sect Area	0.785 ft^2
Outlet Elevation	0 ft	No. of Outlet Barrels	1
		Outlet Pipe Slope	0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft^2]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q_{pipe} [cfs]	Q_{weir} [cfs]	Total Q_{out} [cfs]
0	5,685	0.13				0		0	0	0
			0.15	1.0	0.15		1.39			
1	6,962	0.16				0.15		3	0	3
			0.18	1.0	0.18		0.59			
2	8,341	0.19				0.32		5	0	5
			0.21	1.0	0.21		0.48			
3	9,822	0.23				0.53		6	0	6

Notes:
Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

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Project ***Storyrock Phase 3A***
Subject **Detention Basin Calculations**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: to determine the storage-flow relationship for small detention basins

DB270 ***Drains in 1.86 hours***

Outlet Diameter	0.65 ft	Outlet X-Sect Area	0.332 ft^2
Outlet Elevation	0 ft	No. of Outlet Barrels	1
		Outlet Pipe Slope	0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft^2]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q_{pipe} [cfs]	Q_{weir} [cfs]	Total Q_{out} [cfs]
0	1,958	0.04				0		0	0	0
			0.06	1.0	0.06		1.02			
1	2,861	0.07				0.06		1	0	1
			0.08	1.0	0.08		0.55			
2	3,859	0.09				0.13		2	0	2
			0.10	1.0	0.10		0.29			
3	5,180	0.12				0.24		3	4	7

Notes:
Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

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Project ***Storyrock Phase 3A***
Subject **Detention Basin Calculations**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: to determine the storage-flow relationship for small detention basins

DB311 ***Drains in 3.66 hours***

Outlet Diameter 1.50 ft
Outlet Elevation 0.5 ft
Outlet X-Sect Area 1.767 ft^2
No. of Outlet Barrels 1
Outlet Pipe Slope 0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft^2]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q_{pipe} [cfs]	Q_{weir} [cfs]	Total Q_{out} [cfs]
0	8,150	0.19				0		0	0	0
			0.21	1.0	0.21		2.80			
1	9,775	0.22				0.21		2	0	2
			0.24	1.0	0.24		0.64			
2	11,499	0.26				0.45		7	0	7
			0.28	1.0	0.29		0.22			
3	13,325	0.31				0.74		11	12	23

Notes:
Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

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Project ***Storyrock Phase 3A***
Subject **Detention Basin Calculations**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: to determine the storage-flow relationship for small detention basins

DB313 ***Drains in 4.50 hours***

Outlet Diameter 0.50 ft
Outlet Elevation 0 ft
Outlet X-Sect Area 0.196 ft^2
No. of Outlet Barrels 1
Outlet Pipe Slope 0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft^2]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q_{pipe} [cfs]	Q_{welr} [cfs]	Total Q_{out} [cfs]
0	2,796	0.06				0		0	0	0
			0.08	1.0	0.08		2.24			
1	3,804	0.09				0.08		1	0	1
			0.10	1.0	0.10		1.17			
2	4,912	0.11				0.18		1	0	1
			0.13	1.0	0.13		1.09			
3	6,120	0.14				0.30		2	0	2

Notes:
Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

Kimley»Horn

Project ***Storyrock Phase 3A***
Subject **Detention Basin Calculations**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: to determine the storage-flow relationship for small detention basins

DB325 ***Drains in 2.04 hours***

Outlet Diameter 0.65 ft
Outlet Elevation 0 ft
Outlet X-Sect Area 0.332 ft^2
No. of Outlet Barrels 1
Outlet Pipe Slope 0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft^2]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q_{pipe} [cfs]	Q_{weir} [cfs]	Total Q_{out} [cfs]
0	1,978	0.05				0		0	0	0
			0.06	1.0	0.06		1.10			
1	3,218	0.07				0.06		1	0	1
			0.09	1.0	0.09		0.67			
2	4,916	0.11				0.15		2	0	2
			0.14	1.0	0.14		0.27			
3	7,435	0.17				0.29		3	8	11

Notes:
Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

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Project ***Storyrock Phase 3A***
Subject **Detention Basin Calculations**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: to determine the storage-flow relationship for small detention basins

DB336 ***Drains in 1.12 hours***

Outlet Diameter	2.50 ft	Outlet X-Sect Area	4.909 ft^2
Outlet Elevation	0 ft	No. of Outlet Barrels	1
		Outlet Pipe Slope	0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft^2]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q_{pipe} [cfs]	Q_{weir} [cfs]	Total Q_{out} [cfs]
0	12,654	0.29				0		0	0	0
			0.32	1.0	0.32		0.78			
1	14,953	0.34				0.32		10	0	10
			0.36	1.0	0.36		0.23			
2	16,536	0.38				0.68		28	0	28
			0.41	1.0	0.41		0.10			
3	18,796	0.43				1.08		31	35	66

Notes:
Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

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Project ***Storyrock Phase 3A***
Subject **Detention Basin Calculations**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: to determine the storage-flow relationship for small detention basins

DB340 ***Drains in 4.16 hours***

Outlet Diameter	0.80 ft	Outlet X-Sect Area	0.503 ft^2
Outlet Elevation	0 ft	No. of Outlet Barrels	1
		Outlet Pipe Slope	0.005 ft/ft

Elevation [ft]	Surface Storage Area [ft^2]	Surface Storage Area [acre]	Average Area [acre]	Δ Elev [ft]	Δ Vol [ac-ft]	Σ Vol [ac-ft]	Δ Time to Drain [hr]	Q_{pipe} [cfs]	Q_{weir} [cfs]	Total Q_{out} [cfs]
0	7,660	0.18				0		0	0	0
			0.20	1.0	0.20		2.52			
1	9,364	0.21				0.20		2	0	2
			0.24	1.0	0.24		1.16			
2	11,170	0.26				0.43		3	0	3
			0.28	1.0	0.28		0.48			
3	13,075	0.30				0.71		4	7	11

Notes:
Q_{pipe} goes from Mannings Eqn to Orifice Eqn when water surface exceeds 1.2*(Outlet Diameter)
per Linsley et al. *Water Resources Engineering* 4th Edition, pg 652.

Project ***Storyrock Phase 3A***
Subject **First Flush Summary**
Designed by **ZJH** Date 9/26/2016 Project No. 191988002
Checked by **JMB** Date 9/26/2016

Objective: First Flush Summary

First Flush Volume = A*C*P/12

Contributing Sub Basin	First Flush Method	Contributing Developed Area (sf)	Contributing Developed Area (ac)	First Flush Volume Req. (ac-ft)	Basin Volume Prov. (ac ft)
ON225	Stormceptor /Alternate First Flush Method	N/A	N/A	N/A	N/A
ON265	N/A*	N/A	N/A	N/A	N/A
ON270	Basin	116,698	2.68	0.11	0.24
ON280	N/A*	N/A	N/A	N/A	N/A
ON285	Stormceptor /Alternate First Flush Method	58,703	1.35	0.05	0.14
ON305	Stormceptor /Alternate First Flush Method	58,703	1.35	0.05	0.14
ON310	Stormceptor /Alternate First Flush Method	58,703	1.35	0.05	0.14
ON311	Basin	409,681	9.40	0.37	0.74
ON312	N/A*	N/A	N/A	N/A	N/A
ON313	Basin	117,058	2.69	0.11	0.30
ON315	Stormceptor /Alternate First Flush Method	58,703	1.35	0.05	0.14
ON325	Stormceptor /Alternate First Flush Method	58,703	1.35	0.05	0.14
ON	Basin	118,054	2.71	0.11	0.46
ON182	Stormceptor /Alternate First Flush Method	N/A	N/A	N/A	N/A
ON336	Basin	197,481	4.53	0.18	1.08
ON337	Stormceptor /Alternate First Flush Method	N/A	N/A	N/A	N/A
ON340	Basin	308,980	7.09	0.28	0.71
ON355	N/A*	N/A	N/A	N/A	N/A

Note* Direct discharge of lot drainage only.

Flood Control District of Maricopa County
Drainage Design Management System
HEC-1 STORAGE FACILITIES

Storage Basin ID: DB225

Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
Spillway Crest Elevation:	-NA-	**Volume (ac-ft)**		0.1	0.2	0.2	0.3	0.4	0.5			
Spillway Length:	-NA-	**Discharge (cfs)**	0	1	3	4	5	5	6	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	0.5	1.0	1.5	2.0	2.5	3.0	-	-	-
Weir Coefficient:	-NA-											

Low-Level Outlet (SL)			11	12	13	14.	15	16	17	18	19	20
Centerline Elevation:	-NA-	**Volume (ac-ft)**	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	**Discharge (cfs)**	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											

Top of Dam Overflow (ST)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Elevation Top of Dam:	-NA-	**Peak Volume (ac-ft)**	0.07	0.00	0.15	0.00	0.00	0.32
Length of Dam:	-NA-	**Peak Stage (ft)**	0.50	0.00	1.00	0.00	0.00	2.00
Discharge Coefficient:	-NA-	**Peak Discharge (cfs)**	1.00	0.00	3.00	0.00	0.00	5.00
Weir Coefficient:	-NA-							

Storage Basin ID: DB270

Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
Spillway Crest Elevation:	-NA-	**Volume (ac-ft)**		-	0.1	0.1	0.2	0.2	0.2	0.2		
Spillway Length:	-NA-	**Discharge (cfs)**	0	0	1	1	2	2	3	7	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	0.5	1.0	1.5	2.0	2.5	3.0	3.0	-	-
Weir Coefficient:	-NA-											

Low-Level Outlet (SL)			11	12	13	14.	15	16	17	18	19	20
Centerline Elevation:	-NA-	**Volume (ac-ft)**	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	**Discharge (cfs)**	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											

Top of Dam Overflow (ST)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Elevation Top of Dam:	-NA-	**Peak Volume (ac-ft)**	0.08	0.00	0.16	0.00	0.00	0.24
Length of Dam:	-NA-	**Peak Stage (ft)**	1.00	0.00	2.00	0.00	0.00	3.00
Discharge Coefficient:	-NA-	**Peak Discharge (cfs)**	1.00	0.00	2.00	0.00	0.00	7.00
Weir Coefficient:	-NA-							

Storage Basin ID:	**DB311**										
Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
Spillway Crest Elevation:	-NA-	**Volume (ac-ft)**		0.1	0.2	0.3	0.5	0.6	0.7	0.7		
Spillway Length:	-NA-	**Discharge (cfs)**	0	0	2	5	7	9	11	23	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	0.5	1.0	1.5	2.0	2.5	3.0	3.0	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			11	12	13	14.	15	16	17	18	19	20
Centerline Elevation:	-NA-	**Volume (ac-ft)**	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	**Discharge (cfs)**	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
Elevation Top of Dam:	-NA-	**Peak Volume (ac-ft)**	0.25	0.00	0.45	0.00	0.00	0.74				
Length of Dam:	-NA-	**Peak Stage (ft)**	1.17	0.00	2.00	0.00	0.00	3.00				
Discharge Coefficient:	-NA-	**Peak Discharge (cfs)**	3.00	0.00	7.00	0.00	0.00	23.00				
Weir Coefficient:	-NA-											

Storage Basin ID:	**DB313**										
Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
Spillway Crest Elevation:	-NA-	**Volume (ac-ft)**		-	0.1	0.1	0.2	0.2	0.3			
Spillway Length:	-NA-	**Discharge (cfs)**	0	0	1	1	1	2	2	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	0.5	1.0	1.5	2.0	2.5	3.0	-	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			11	12	13	14.	15	16	17	18	19	20
Centerline Elevation:	-NA-	**Volume (ac-ft)**	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	**Discharge (cfs)**	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
Elevation Top of Dam:	-NA-	**Peak Volume (ac-ft)**	0.08	0.00	0.08	0.00	0.00	0.23				
Length of Dam:	-NA-	**Peak Stage (ft)**	1.00	0.00	1.00	0.00	0.00	2.50				
Discharge Coefficient:	-NA-	**Peak Discharge (cfs)**	1.00	0.00	1.00	0.00	0.00	2.00				
Weir Coefficient:	-NA-											

Storage Basin ID:	**DB325**										
Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
Spillway Crest Elevation:	-NA-	**Volume (ac-ft)**		0.1	0.1	0.2	0.2	0.3	0.3	0.3		
Spillway Length:	-NA-	**Discharge (cfs)**	0	0	1	2	2	3	3	11	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	0.5	1.0	1.5	2.0	2.5	3.0	3.0	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			11	12	13	14.	15	16	17	18	19	20
Centerline Elevation:	-NA-	**Volume (ac-ft)**	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	**Discharge (cfs)**	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
Elevation Top of Dam:	-NA-	**Peak Volume (ac-ft)**	0.10	0.00	0.15	0.00	0.00	0.30				
Length of Dam:	-NA-	**Peak Stage (ft)**	1.00	0.00	1.50	0.00	0.00	3.00				
Discharge Coefficient:	-NA-	**Peak Discharge (cfs)**	1.00	0.00	2.00	0.00	0.00	11.00				
Weir Coefficient:	-NA-											

Storage Basin ID:	**DB336**										
Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
Spillway Crest Elevation:	-NA-	**Volume (ac-ft)**		0.2	0.3	0.5	0.7	0.7	1.1	1.1		
Spillway Length:	-NA-	**Discharge (cfs)**	0	6	10	18	28	35	45	66	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	0.5	1.0	1.5	2.0	2.5	3.0	3.0	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			11	12	13	14.	15	16	17	18	19	20
Centerline Elevation:	-NA-	**Volume (ac-ft)**	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	**Discharge (cfs)**	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
Elevation Top of Dam:	-NA-	**Peak Volume (ac-ft)**	0.24	0.00	0.59	0.00	0.00	1.08				
Length of Dam:	-NA-	**Peak Stage (ft)**	0.75	0.00	1.75	0.00	0.00	3.00				
Discharge Coefficient:	-NA-	**Peak Discharge (cfs)**	8.00	0.00	23.00	0.00	0.00	66.00				
Weir Coefficient:	-NA-											

Storage Basin ID:	**DB340**										
Spillway Characteristics (SS)			1	2	3	4	5	6	7	8	9	10
Spillway Crest Elevation:	-NA-	**Volume (ac-ft)**		0.1	0.2	0.3	0.4	0.6	0.7	0.7		
Spillway Length:	-NA-	**Discharge (cfs)**	0	1	2	3	4	5	6	11	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	0.5	1.0	1.5	2.0	2.5	3.0	3.0	-	-
Weir Coefficient:	-NA-											
Low-Level Outlet (SL)			11	12	13	14.	15	16	17	18	19	20
Centerline Elevation:	-NA-	**Volume (ac-ft)**	-	-	-	-	-	-	-	-	-	-
Cross-Section Area:	-NA-	**Discharge (cfs)**	0	0	0	0	0	0	0	0	0	0
Discharge Coefficient:	-NA-	**Elevation (ft)**	-	-	-	-	-	-	-	-	-	-
Orifice Equation Exponent:	-NA-											
Top of Dam Overflow (ST)			2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr				
Elevation Top of Dam:	-NA-	**Peak Volume (ac-ft)**	0.20	0.00	0.43	0.00	0.00	0.70				
Length of Dam:	-NA-	**Peak Stage (ft)**	1.00	0.00	2.00	0.00	0.00	3.00				
Discharge Coefficient:	-NA-	**Peak Discharge (cfs)**	2.00	0.00	4.00	0.00	0.00	11.00				
Weir Coefficient:	-NA-											

Flood Control District of Maricopa County
Drainage Design Management System
HEC-1 ROUTING DATA
Project Reference: STORYROCK PH3 PROP

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
NORMAL DEPTH															
Major Basin 01															
RO215A	0.050	0.035	0.050	975.00	0.0360	-	X:	-	9.00	21.00	25.00	32.00	36.00	70.00	90.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO215B	0.050	0.035	0.050	800.00	0.0340	-	X:	-	6.00	10.00	13.00	19.00	21.00	26.00	62.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO215C	0.050	0.035	0.050	445.00	0.0340	-	X:	-	12.00	28.00	36.00	48.00	71.00	73.00	76.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO215D	0.050	0.035	0.050	364.00	0.0300	-	X:	-	5.00	8.00	11.00	11.10	14.00	17.00	24.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO220	0.050	0.035	0.050	310.00	0.0420	-	X:	-	8.00	15.00	21.00	21.10	25.00	30.00	36.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO230A	0.050	0.035	0.050	770.00	0.0340	-	X:	-	10.00	20.00	35.00	51.00	61.00	68.00	73.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO230B	0.050	0.035	0.050	270.00	0.0480	-	X:	-	9.00	30.00	45.00	118.00	122.00	127.00	132.00
							Y:	2.00	1.00	0.50	-	-	1.00	2.00	3.00
RO240A	0.050	0.035	0.050	245.00	0.0370	-	X:	-	5.00	10.00	14.00	32.00	41.00	48.00	52.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO240B	0.050	0.035	0.050	465.00	0.0390	-	X:	-	7.00	19.00	49.00	65.00	70.00	77.00	85.00
							Y:	2.00	0.50	1.00	-	-	1.00	-	2.00
RO250A	0.050	0.035	0.050	433.00	0.0420	-	X:	-	8.00	17.00	25.00	47.00	51.00	58.00	62.00
							Y:	2.00	1.00	0.50	-	-	0.50	0.75	1.00
RO250B	0.050	0.035	0.050	650.00	0.0400	-	X:	-	26.00	31.00	38.00	39.00	44.00	58.00	68.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RO250C	0.050	0.035	0.050	402.00	0.0350	-	X:	-	26.00	31.00	38.00	39.00	44.00	58.00	68.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO250D	0.050	0.035	0.050	271.00	0.0410	-	X:	-	34.00	60.00	71.00	81.00	110.00	121.00	134.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO255	0.050	0.035	0.050	213.00	0.0470	-	X:	-	6.00	11.00	18.00	18.10	27.00	35.00	40.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO260A	0.050	0.035	0.050	225.00	0.0360	-	X:	-	7.00	15.00	26.00	29.00	34.00	42.00	50.00
							Y:	2.00	1.00	-	-	1.00	1.00	0.50	1.00
RO260B	0.050	0.035	0.050	361.00	0.0280	-	X:	-	23.00	44.00	69.00	70.00	85.00	92.00	104.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO285A	0.050	0.035	0.050	378.00	0.0420	-	X:	-	34.00	64.00	88.00	110.00	115.00	118.00	120.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO285B	0.050	0.035	0.050	543.00	0.0370	-	X:	-	12.00	12.00	14.00	14.10	19.00	24.00	28.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO285C	0.050	0.035	0.050	315.00	0.0410	-	X:	-	8.00	15.00	22.00	149.00	169.00	178.00	182.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO305A	0.050	0.035	0.050	685.00	0.0480	-	X:	-	10.00	21.00	30.00	43.00	61.00	68.00	75.00
							Y:	3.00	2.00	1.00	-	-	1.00	-	1.00
RO305B	0.050	0.035	0.050	970.00	0.0480	-	X:	-	6.00	8.00	20.00	32.00	43.00	51.00	66.00
							Y:	3.00	2.00	1.00	-	-	1.00	1.50	2.00
RO305C	0.050	0.035	0.050	653.00	0.0430	-	X:	-	10.00	15.00	26.00	43.00	155.00	165.00	169.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO310A	0.050	0.035	0.050	1,060.00	0.0420	-	X:	-	8.00	20.00	32.00	36.00	42.00	46.00	50.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00

Route ID	LOB N	Chan N	ROB N	Length (ft)	Slope (ft/ft)	Max Elev (ft)		1.	2.	3.	4.	5.	6.	7.	8.
RO310B	0.050	0.035	0.050	850.00	0.0470	-	X:	-	6.00	8.00	10.00	12.00	14.00	15.00	19.00
							Y:	4.00	3.00	2.00	-	-	2.00	3.00	4.00
RO310C	0.050	0.035	0.050	1,000.00	0.0450	-	X:	-	4.00	8.00	16.00	20.00	22.00	24.00	26.00
							Y:	3.00	2.50	2.00	-	-	2.00	3.00	4.00
RO312	0.050	0.035	0.050	675.00	0.0410	-	X:	-	4.00	6.00	10.00	12.00	24.00	74.00	83.00
							Y:	4.00	3.00	2.00	-	-	2.00	3.00	4.00
RO326	0.050	0.035	0.050	963.00	0.0370	-	X:	-	10.00	13.00	16.00	16.50	19.00	20.00	22.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO335	0.050	0.035	0.050	688.00	0.0420	-	X:	-	2.00	4.00	6.00	6.10	10.00	12.00	15.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO337	0.050	0.035	0.050	467.00	0.0470	-	X:	-	10.00	12.00	18.00	18.10	22.00	26.00	50.00
							Y:	5.00	3.00	3.00	-	-	3.00	4.00	5.00
RO339	0.050	0.035	0.050	492.00	0.0410	-	X:	-	4.00	7.00	12.00	27.00	37.00	42.00	50.00
							Y:	3.00	2.00	1.00	-	-	1.00	2.00	3.00
RO340	0.050	0.035	0.050	820.00	0.0420	-	X:	-	10.00	12.00	18.00	18.10	22.00	26.00	50.00
							Y:	5.00	3.00	3.00	-	-	3.00	4.00	5.00
RO345	0.050	0.035	0.050	490.00	0.0490	-	X:	-	6.00	10.00	12.00	12.10	15.00	17.00	21.00
							Y:	5.00	3.00	3.00	-	-	3.00	4.00	5.00

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   19FEB17  TIME  18:15:44   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

    1         ID       Flood Control District of Maricopa County
    2         ID       STORYROCK PH3 PROP -- STORYROCK PHASE 3 PROP CONDITION
    3         ID       2 YEAR
    4         ID       6 Hour  Storm
    5         ID       Unit Hydrograph: Clark
    6         ID       Storm: Multiple
    7         ID       02/19/2017
              *DIAGRAM
    8         IT      5  1JAN99      0   2000
    9         IO      5
   10         IN     15
              *
   11         JD   1.419  0.0001
   12         PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
   13         PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
   14         PC   0.962   0.972   0.983   0.991   1.000
   15         JD   1.410  0.5000
   16         PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
   17         PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
   18         PC   0.962   0.972   0.983   0.991   1.000
   19         JD   1.384     2.8
   20         PC   0.000   0.009   0.016   0.025   0.034   0.042   0.051   0.059   0.067   0.076
   21         PC   0.087   0.100   0.120   0.163   0.252   0.451   0.694   0.837   0.900   0.938
   22         PC   0.950   0.963   0.975   0.988   1.000
              *

   23         KK  OFF105   BASIN
   24         BA   0.085
   25         LG    0.35    0.40    6.00    0.18       0
   26         UC   0.538   0.678
   27         UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   28         UA     100
              *

   29         KK  RO215A   ROUTE
   30         RS       1    FLOW
   31         RC   0.050   0.035   0.050     975  0.0360    0.00
   32         RX    0.00    9.00   21.00   25.00   32.00   36.00   70.00   90.00
   33         RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
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34          KK  OFF110   BASIN
35          BA   0.037
36          LG    0.35    0.40    6.00    0.18       0
37          UC   0.428   0.595
38          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
39          UA     100
            *

40          KK  OFF115   BASIN
41          BA   0.007
42          LG    0.35    0.40    6.00    0.18       0
43          UC   0.227   0.236
44          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
45          UA     100
            *
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LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

46          KK   RO220   ROUTE
47          RS       1    FLOW
48          RC   0.050   0.035   0.050     310  0.0420    0.00
49          RX    0.00    8.00   15.00   21.00   21.10   25.00   30.00   36.00
50          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

51          KK   ON220   BASIN
52          BA   0.002
53          LG    0.30    0.25    6.00    0.17      17
54          UC   0.135   0.237
55          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
56          UA     100
            *

57          KK   CO220 COMBINE
58          HC       2
            *

59          KK  RO215D   ROUTE
60          RS       1    FLOW
61          RC   0.050   0.035   0.050     364  0.0300    0.00
62          RX    0.00    5.00    8.00   11.00   11.10   14.00   17.00   24.00
63          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *

64          KK  CO215A COMBINE
65          HC       2
            *

66          KK  RO215B   ROUTE
67          RS       1    FLOW
68          RC   0.050   0.035   0.050     800  0.0340    0.00
69          RX    0.00    6.00   10.00   13.00   19.00   21.00   26.00   62.00
70          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

71          KK  CO215B COMBINE
72          HC       2
            *

73          KK  RO215C   ROUTE
74          RS       1    FLOW
75          RC   0.050   0.035   0.050     445  0.0340    0.00
76          RX    0.00   12.00   28.00   36.00   48.00   71.00   73.00   76.00
77          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

78          KK   ON215   BASIN
79          BA   0.030
80          LG    0.35    0.40    6.00    0.18       0
81          UC   0.349   0.341
82          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
83          UA     100
            *
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 84          KK  CO215C COMBINE
 85          HC       2
             *

 86          KK  RO240A   ROUTE
 87          RS       1    FLOW
 88          RC   0.050   0.035   0.050     245  0.0370    0.00
 89          RX    0.00    5.00   10.00   14.00   32.00   41.00   48.00   52.00
 90          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

 91          KK   ON235   BASIN
 92          BA   0.002
 93          LG    0.35    0.40    6.00    0.18       0
 94          UC   0.176   0.222
 95          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 96          UA     100
             *

 97          KK  CO240A COMBINE
 98          HC       2
             *

 99          KK  RO240B   ROUTE
100          RS       1    FLOW
101          RC   0.050   0.035   0.050     465  0.0390    0.00
102          RX    0.00    7.00   19.00   49.00   65.00   70.00   77.00   85.00
103          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

104          KK   ON240   BASIN
105          BA   0.007
106          LG    0.35    0.40    6.00    0.18       0
107          UC   0.276   0.380
108          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
109          UA     100
             *

110          KK  CO240B COMBINE
111          HC       2
             *

112          KK  RO260A   ROUTE
113          RS       1    FLOW
114          RC   0.050   0.035   0.050     225  0.0360    0.00
115          RX    0.00    7.00   15.00   26.00   29.00   34.00   42.00   50.00
116          RY    2.00    1.00    0.00    0.00    1.00    1.00    0.50    1.00
             *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117          KK   ON245   BASIN
118          BA   0.003
119          LG    0.35    0.40    6.00    0.18       0
120          UC   0.230   0.363
121          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
122          UA     100
             *

123          KK  RO260B   ROUTE
124          RS       1    FLOW
125          RC   0.050   0.035   0.050     361  0.0280    0.00
126          RX    0.00   23.00   44.00   69.00   70.00   85.00   92.00  104.00
127          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

128          KK   ON260   BASIN
129          BA   0.002
130          LG    0.35    0.40    6.00    0.18       0
131          UC   0.217   0.341
132          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
133          UA     100
             *
```

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                *
     136        KK   ON265   BASIN
     137        BA   0.001
     138        LG    0.30    0.25    6.00    0.22      27
     139        UC   0.100   0.155
     140        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     141        UA     100
                *
     142        KK   ON270   BASIN
     143        BA   0.004
     144        LG    0.30    0.25    6.00    0.22      27
     145        UC   0.165   0.269
     146        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     147        UA     100
                *
     148        KK   DB270 STORAGE
     149        KO
     150        RS       1    STOR
     151        SV            0.04    0.08    0.12    0.16    0.20    0.24    0.24
     152        SQ                    1.00    1.00    2.00    2.00    3.00    7.00
     153        SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
                *
1                                        HEC-1 INPUT                                    PAGE  5

   LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

     154        KK   ON280   BASIN
     155        BA   0.001
     156        LG    0.30    0.25    6.00    0.22      27
     157        UC   0.094   0.105
     158        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     159        UA     100
                *
     160        KK  OFF120   BASIN
     161        BA   0.095
     162        LG    0.35    0.40    6.00    0.18       0
     163        UC   0.566   0.825
     164        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     165        UA     100
                *
     166        KK  RO305A   ROUTE
     167        RS       1    FLOW
     168        RC   0.050   0.035   0.050     685  0.0480    0.00
     169        RX    0.00   10.00   21.00   30.00   43.00   61.00   68.00   75.00
     170        RY    3.00    2.00    1.00    0.00    0.00    1.00    0.00    1.00
                *
     171        KK  OFF125   BASIN
     172        BA   0.109
     173        LG    0.35    0.40    6.00    0.18       2
     174        UC   0.594   0.883
     175        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     176        UA     100
                *
     177        KK  RO305B   ROUTE
     178        RS       1    FLOW
     179        RC   0.050   0.035   0.050     970  0.0480    0.00
     180        RX    0.00    6.00    8.00   20.00   32.00   43.00   51.00   66.00
     181        RY    3.00    2.00    1.00    0.00    0.00    1.00    1.50    2.00
                *
     182        KK  CO305A COMBINE
     183        HC       2
                *
     184        KK  RO305C   ROUTE
     185        RS       1    FLOW
     186        RC   0.050   0.035   0.050     653  0.0430    0.00
     187        RX    0.00   10.00   15.00   26.00   43.00  155.00  165.00  169.00
     188        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *
```

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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 189          KK   ON305   BASIN
 190          BA   0.023
 191          LG    0.30    0.29    6.00    0.18      15
 192          UC   0.250   0.281
 193          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 194          UA     100
              *

 195          KK  CO305B COMBINE
 196          HC       2
              *

 197          KK  RO230B   ROUTE
 198          RS       1    FLOW
 199          RC   0.050   0.035   0.050     270  0.0480    0.00
 200          RX    0.00    9.00   30.00   45.00  118.00  122.00  127.00  132.00
 201          RY    2.00    1.00    0.50    0.00    0.00    1.00    2.00    3.00
              *

 202          KK   ON225   BASIN
 203          BA   0.005
 204          LG    0.30    0.25    6.00    0.19      19
 205          UC   0.156   0.199
 206          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 207          UA     100
              *

 208          KK   DB225 STORAGE
 209          KO
 210          RS       1    STOR
 211          SV            0.07    0.15    0.22    0.32    0.42    0.53
 212          SQ            1.00    3.00    4.00    5.00    5.00    6.00
 213          SE            0.50    1.00    1.50    2.00    2.50    3.00
              *

 214          KK  RO230A   ROUTE
 215          RS       1    FLOW
 216          RC   0.050   0.035   0.050     770  0.0340    0.00
 217          RX    0.00   10.00   20.00   35.00   51.00   61.00   68.00   73.00
 218          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

 219          KK   ON230   BASIN
 220          BA   0.007
 221          LG    0.35    0.40    6.00    0.18       0
 222          UC   0.277   0.348
 223          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 224          UA     100
              *

1                                        HEC-1 INPUT                                    PAGE  7

LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 225          KK   CO230 COMBINE
 226          HC       3
              *

 227          KK  RO250A   ROUTE
 228          RS       1    FLOW
 229          RC   0.050   0.035   0.050     433  0.0420    0.00
 230          RX    0.00    8.00   17.00   25.00   47.00   51.00   58.00   62.00
 231          RY    2.00    1.00    0.50    0.00    0.00    0.50    0.75    1.00
              *

 232          KK   ON320   BASIN
 233          BA   0.001
 234          LG    0.35    0.40    6.00    0.18       0
 235          UC   0.176   0.252
 236          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 237          UA     100
              *

 238          KK  RO250B   ROUTE
```

```
240          RC   0.050   0.035   0.050     650  0.0400    0.00
241          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
242          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

243          KK   ON315   BASIN
244          BA   0.009
245          LG    0.31    0.28    6.00    0.17      13
246          UC   0.208   0.283
247          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
248          UA     100
             *

249          KK  RO250C   ROUTE
250          RS       1    FLOW
251          RC   0.050   0.035   0.050     402  0.0350    0.00
252          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
253          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

254          KK  CO250A COMBINE
255          HC       3
             *

256          KK  RO250D   ROUTE
257          RS       1    FLOW
258          RC   0.050   0.035   0.050     271  0.0410    0.00
259          RX    0.00   34.00   60.00   71.00   81.00  110.00  121.00  134.00
260          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
1                                          HEC-1 INPUT                                              PAGE  8

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


261          KK   ON250   BASIN
262          BA   0.009
263          LG    0.35    0.40    6.00    0.18       0
264          UC   0.277   0.331
265          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
266          UA     100
             *

267          KK  CO250B COMBINE
268          HC       2
             *

269          KK  RO285A   ROUTE
270          RS       1    FLOW
271          RC   0.050   0.035   0.050     378  0.0420    0.00
272          RX    0.00   34.00   64.00   88.00  110.00  115.00  118.00  120.00
273          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

274          KK   ON330   BASIN
275          BA   0.001
276          LG    0.35    0.40    6.00    0.18       0
277          UC   0.165   0.271
278          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
279          UA     100
             *

280          KK   RO255   ROUTE
281          RS       1    FLOW
282          RC   0.050   0.035   0.050     213  0.0470    0.00
283          RX    0.00    6.00   11.00   18.00   18.10   27.00   35.00   40.00
284          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

285          KK   ON255   BASIN
286          BA   0.002
287          LG    0.35    0.40    6.00    0.18       0
288          UC   0.176   0.221
289          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
290          UA     100
             *
```

```
                *
          293   KK  RO285B   ROUTE
          294   RS       1    FLOW
          295   RC   0.050   0.035   0.050     543  0.0370    0.00
          296   RX    0.00   12.00   12.00   14.00   14.10   19.00   24.00   28.00
          297   RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *
1                                        HEC-1 INPUT                                    PAGE  9

     LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10


          298   KK  CO285A COMBINE
          299   HC       2
                *

          300   KK  RO285C   ROUTE
          301   RS       1    FLOW
          302   RC   0.050   0.035   0.050     315  0.0410    0.00
          303   RX    0.00    8.00   15.00   22.00  149.00  169.00  178.00  182.00
          304   RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *

          305   KK  ON285   BASIN
          306   BA  0.009
          307   LG   0.32    0.31    6.00    0.17      11
          308   UC  0.205   0.237
          309   UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          310   UA     100
                *

          311   KK  CO285B COMBINE
          312   HC       2
                *

          313   KK  ON325   BASIN
          314   BA  0.006
          315   LG   0.31    0.28    6.00    0.17      14
          316   UC  0.183   0.264
          317   UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          318   UA     100
                *

          319   KK  DB325 STORAGE
          320   KO
          321   RS       1    STOR
          322   SV            0.05    0.10    0.15    0.20    0.25    0.30    0.30
          323   SQ                    1.00    2.00    2.00    3.00    3.00   11.00
          324   SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
                *

          325   KK  RO326   ROUTE
          326   RS       1    FLOW
          327   RC   0.050   0.035   0.050     963  0.0370    0.00
          328   RX    0.00   10.00   13.00   16.00   16.50   19.00   20.00   22.00
          329   RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *

          330   KK  ON326   BASIN
          331   BA  0.007
          332   LG   0.31    0.29    6.00    0.17      12
          333   UC  0.237   0.363
          334   UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          335   UA     100
                *
1                                        HEC-1 INPUT                                    PAGE 10

     LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10


          336   KK  CO326 COMBINE
          337   HC       2
                *

          338   KK  ON360   BASIN
          339   BA  0.001
```

```
342          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
343          UA     100
             *

344          KK    CEX1 COMBINE
345          HC       5
             *

346          KK  OFF130   BASIN
347          BA   0.018
348          LG    0.35    0.40    6.00    0.18       0
349          UC   0.305   0.343
350          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
351          UA     100
             *

352          KK  OFF135   BASIN
353          BA   0.057
354          LG    0.35    0.40    6.00    0.18       0
355          UC   0.578   1.063
356          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
357          UA     100
             *

358          KK  CO310A COMBINE
359          HC       2
             *

360          KK  RO310A   ROUTE
361          RS       1    FLOW
362          RC   0.050   0.035   0.050    1060  0.0420    0.00
363          RX    0.00    8.00   20.00   32.00   36.00   42.00   46.00   50.00
364          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

365          KK  OFF145   BASIN
366          BA   0.004
367          LG    0.35    0.40    6.00    0.18       0
368          UC   0.231   0.331
369          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
370          UA     100
             *
```



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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

371          KK  RO310B   ROUTE
372          RS       1    FLOW
373          RC   0.050   0.035   0.050     850  0.0470    0.00
374          RX    0.00    6.00    8.00   10.00   12.00   14.00   15.00   19.00
375          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *

376          KK  CO310B COMBINE
377          HC       2
             *

378          KK  RO310C   ROUTE
379          RS       1    FLOW
380          RC   0.050   0.035   0.050    1000  0.0450    0.00
381          RX    0.00    4.00    8.00   16.00   20.00   22.00   24.00   26.00
382          RY    3.00    2.50    2.00    0.00    0.00    2.00    3.00    4.00
             *

383          KK   ON310   BASIN
384          BA   0.018
385          LG    0.31    0.28    6.00    0.18      15
386          UC   0.300   0.534
387          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
388          UA     100
             *

389          KK   ON311   BASIN
390          BA   0.015
391          LG    0.30    0.26    6.00    0.19      17
392          UC   0.242   0.370
```

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                  *

   395            KK   DB311 STORAGE
   396            KO
   397            RS       1    STOR
   398            SV          0.12    0.21    0.32    0.45    0.60    0.74    0.74
   399            SQ                  2.00    5.00    7.00    9.00   11.00   23.00
   400            SE          0.50    1.00    1.50    2.00    2.50    3.00    3.01
                  *

   401            KK  CO310D COMBINE
   402            HC       3
                  *

   403            KK   RO312   ROUTE
   404            RS       1    FLOW
   405            RC   0.050   0.035   0.050     675  0.0410    0.00
   406            RX    0.00    4.00    6.00   10.00   12.00   24.00   74.00   83.00
   407            RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
                  *
1                                              HEC-1 INPUT                                             PAGE 12

 LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


   408            KK   ON312   BASIN
   409            BA   0.004
   410            LG    0.32    0.31    6.00    0.17      10
   411            UC   0.186   0.277
   412            UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   413            UA     100
                  *

   414            KK   ON313   BASIN
   415            BA   0.004
   416            LG    0.29    0.36    6.00    0.20      15
   417            UC   0.233   0.375
   418            UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   419            UA     100
                  *

   420            KK   DB313 STORAGE
   421            KO
   422            RS       1    STOR
   423            SV          0.04    0.08    0.12    0.18    0.23    0.30
   424            SQ                  1.00    1.00    1.00    2.00    2.00
   425            SE          0.50    1.00    1.50    2.00    2.50    3.00
                  *

   426            KK   CO312 COMBINE
   427            HC       3
                  *

   428            KK   ON355   BASIN
   429            BA   0.001
   430            LG    0.30    0.25    6.00    0.17      17
   431            UC   0.097   0.130
   432            UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   433            UA     100
                  *

   434            KK  OFF140   BASIN
   435            BA   0.035
   436            LG    0.35    0.40    6.00    0.18       0
   437            UC   0.423   0.570
   438            UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   439            UA     100
                  *

   440            KK  OFF150   BASIN
   441            BA   0.004
   442            LG    0.35    0.40    6.00    0.18       0
   443            UC   0.244   0.374
   444            UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
   445            UA     100
                  *
1                                              HEC-1 INPUT                                             PAGE 13
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```
446          KK   CO335 COMBINE
447          HC      2
             *

448          KK   RO335   ROUTE
449          RS      1    FLOW
450          RC  0.050  0.035  0.050    688  0.0420   0.00
451          RX   0.00   2.00   4.00   6.00   6.10  10.00  12.00  15.00
452          RY   3.00   2.00   1.00   0.00   0.00   1.00   2.00   3.00
             *

453          KK   ON335   BASIN
454          BA  0.002
455          LG   0.33   0.33   6.00   0.17      9
456          UC  0.217  0.569
457          UA      0    3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
458          UA    100
             *

459          KK   ON336   BASIN
460          BA  0.007
461          LG   0.31   0.27   6.00   0.19     16
462          UC  0.159  0.149
463          UA      0    3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
464          UA    100
             *

465          KK   CO336 COMBINE
466          HC      3
             *

467          KK   DB336 STORAGE
468          KO
469          RS      1    STOR
470          SV           0.16   0.32   0.49   0.68   0.67   1.08   1.08
471          SQ           6.00  10.00  18.00  28.00  35.00  45.00  66.00
472          SE           0.50   1.00   1.50   2.00   2.50   2.95   3.00
             *

473          KK   RO337   ROUTE
474          RS      1    FLOW
475          RC  0.050  0.035  0.050    467  0.0470   0.00
476          RX   0.00  10.00  12.00  18.00  18.10  22.00  26.00  50.00
477          RY   5.00   3.00   3.00   0.00   0.00   3.00   4.00   5.00
             *

478          KK   ON337   BASIN
479          BA  0.009
480          LG   0.31   0.27   6.00   0.18     17
481          UC  0.261  0.441
482          UA      0    3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
483          UA    100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

484          KK   CO337 COMBINE
485          HC      2
             *

486          KK  OFF155   BASIN
487          BA  0.004
488          LG   0.35   0.40   6.00   0.18      0
489          UC  0.258  0.441
490          UA      0    3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
491          UA    100
             *

492          KK  OFF160   BASIN
493          BA  0.035
494          LG   0.35   0.40   6.00   0.18      0
495          UC  0.503  0.916
496          UA      0    3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
497          UA    100
```

```
  498          KK  CO340A COMBINE
  499          HC       2
               *

  500          KK   RO340   ROUTE
  501          RS       1    FLOW
  502          RC   0.050   0.035   0.050     820  0.0420    0.00
  503          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
  504          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
               *

  505          KK   ON340   BASIN
  506          BA   0.011
  507          LG    0.31    0.28    6.00    0.17      14
  508          UC   0.214   0.288
  509          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  510          UA     100
               *

  511          KK   DB340 STORAGE
  512          KO
  513          RS       1    STOR
  514          SV            0.10    0.20    0.31    0.43    0.55    0.70    0.70
  515          SQ            1.00    2.00    3.00    4.00    5.00    6.00   11.00
  516          SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
               *

  517          KK  CO340B COMBINE
  518          HC       2
               *
1                                        HEC-1 INPUT                                PAGE 15

 LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  519          KK  OFF165   BASIN
  520          BA   0.003
  521          LG    0.35    0.40    6.00    0.18       0
  522          UC   0.182   0.203
  523          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  524          UA     100
               *

  525          KK   RO345   ROUTE
  526          RS       1    FLOW
  527          RC   0.050   0.035   0.050     490  0.0490    0.00
  528          RX    0.00    6.00   10.00   12.00   12.10   15.00   17.00   21.00
  529          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
               *

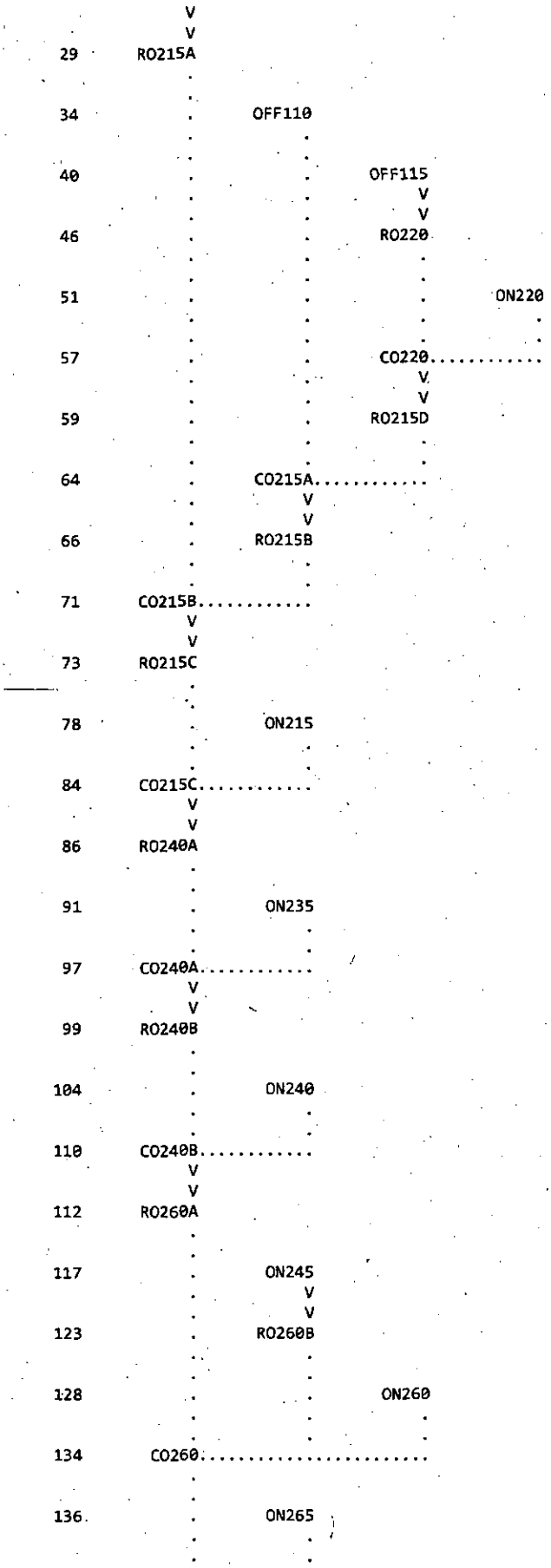
  530          KK   ON345   BASIN
  531          BA   0.002
  532          LG    0.35    0.40    6.00    0.18       0
  533          UC   0.250   0.569
  534          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  535          UA     100
               *

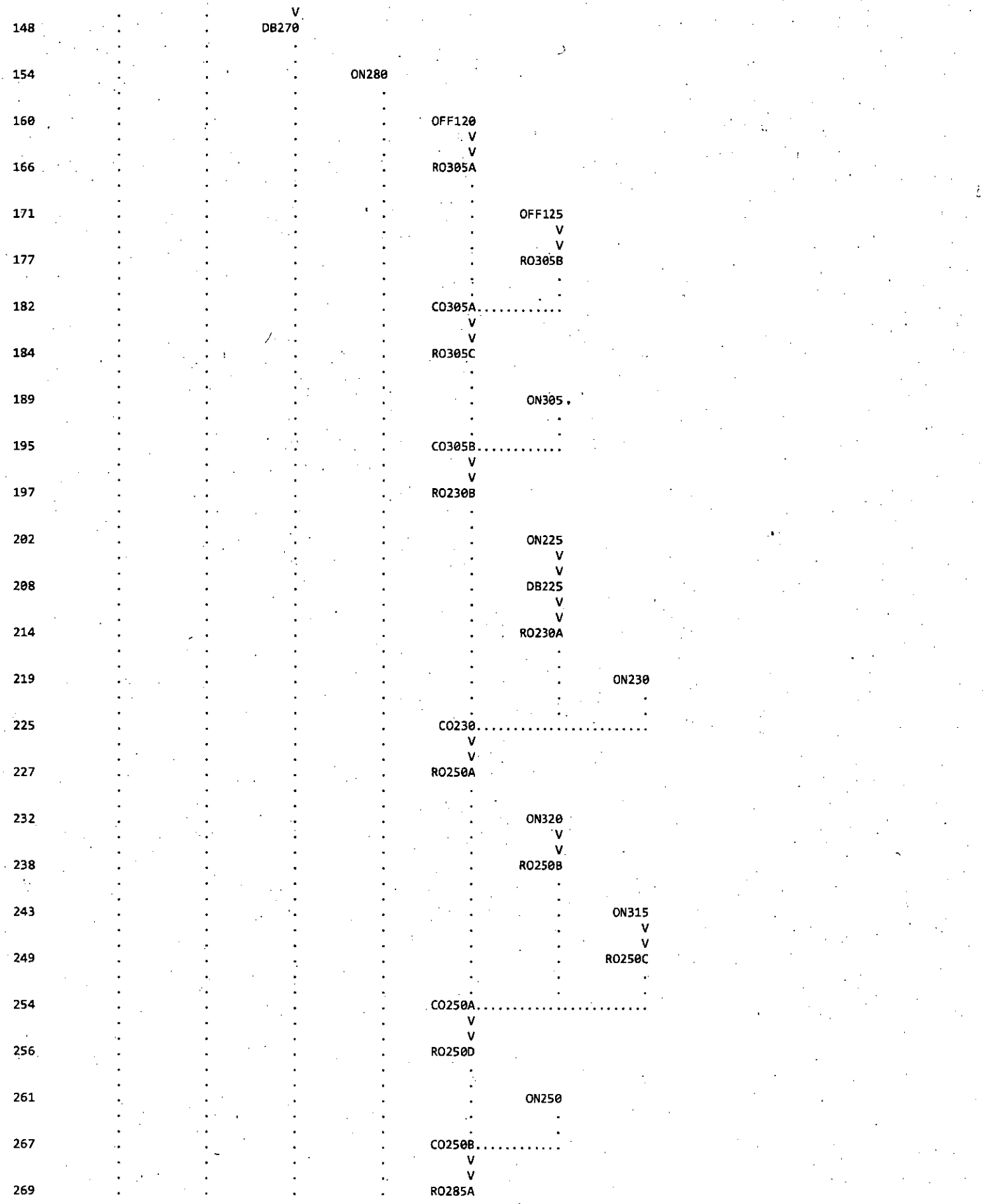
  536          KK   CO345 COMBINE
  537          HC       2
               *

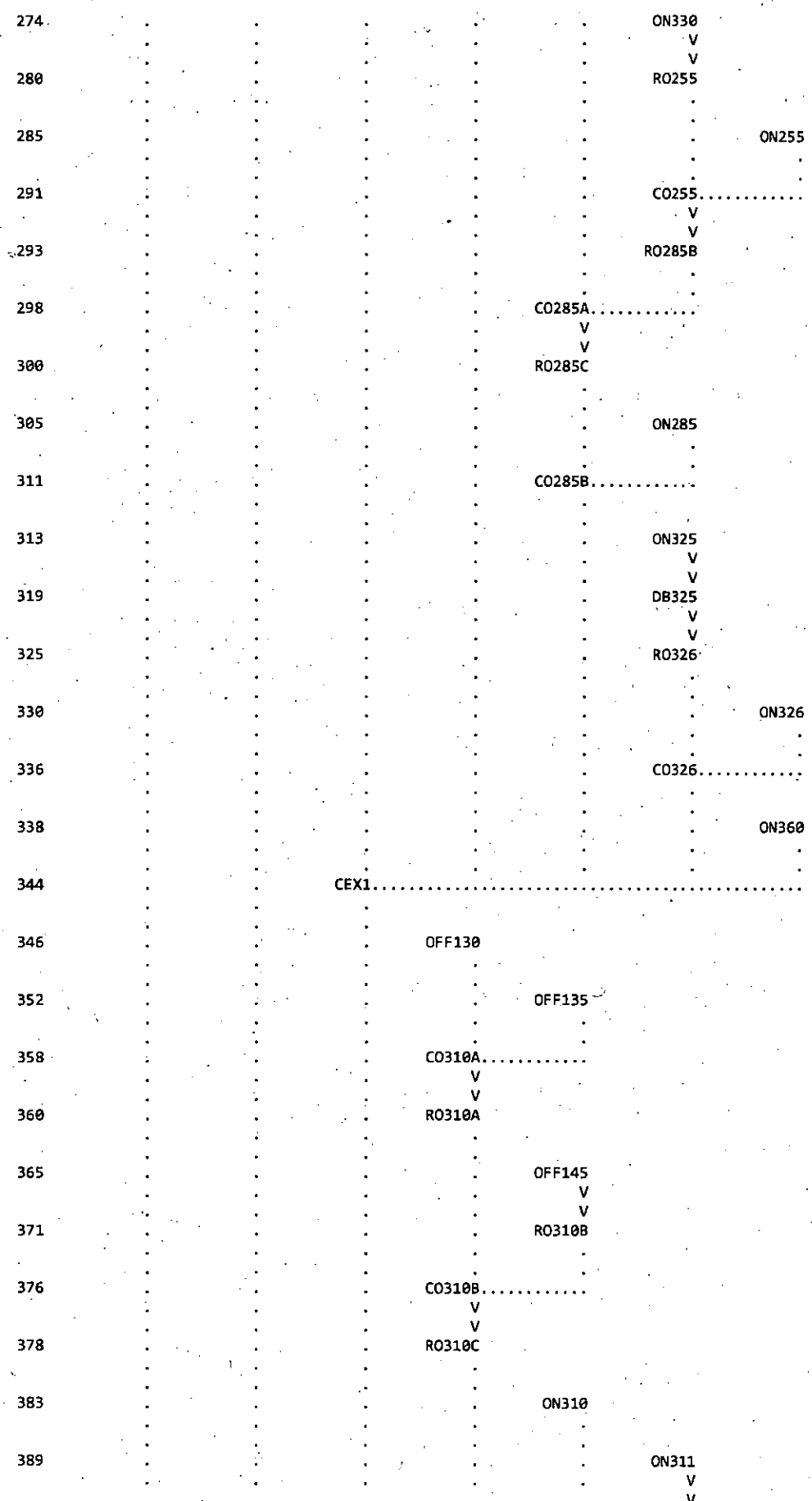
  538          KK   ON350   BASIN
  539          BA   0.001
  540          LG    0.33    0.33    6.00    0.17       9
  541          UC   0.130   0.208
  542          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  543          UA     100
               *
  544          ZZ
1
            SCHEMATIC DIAGRAM OF STREAM NETWORK

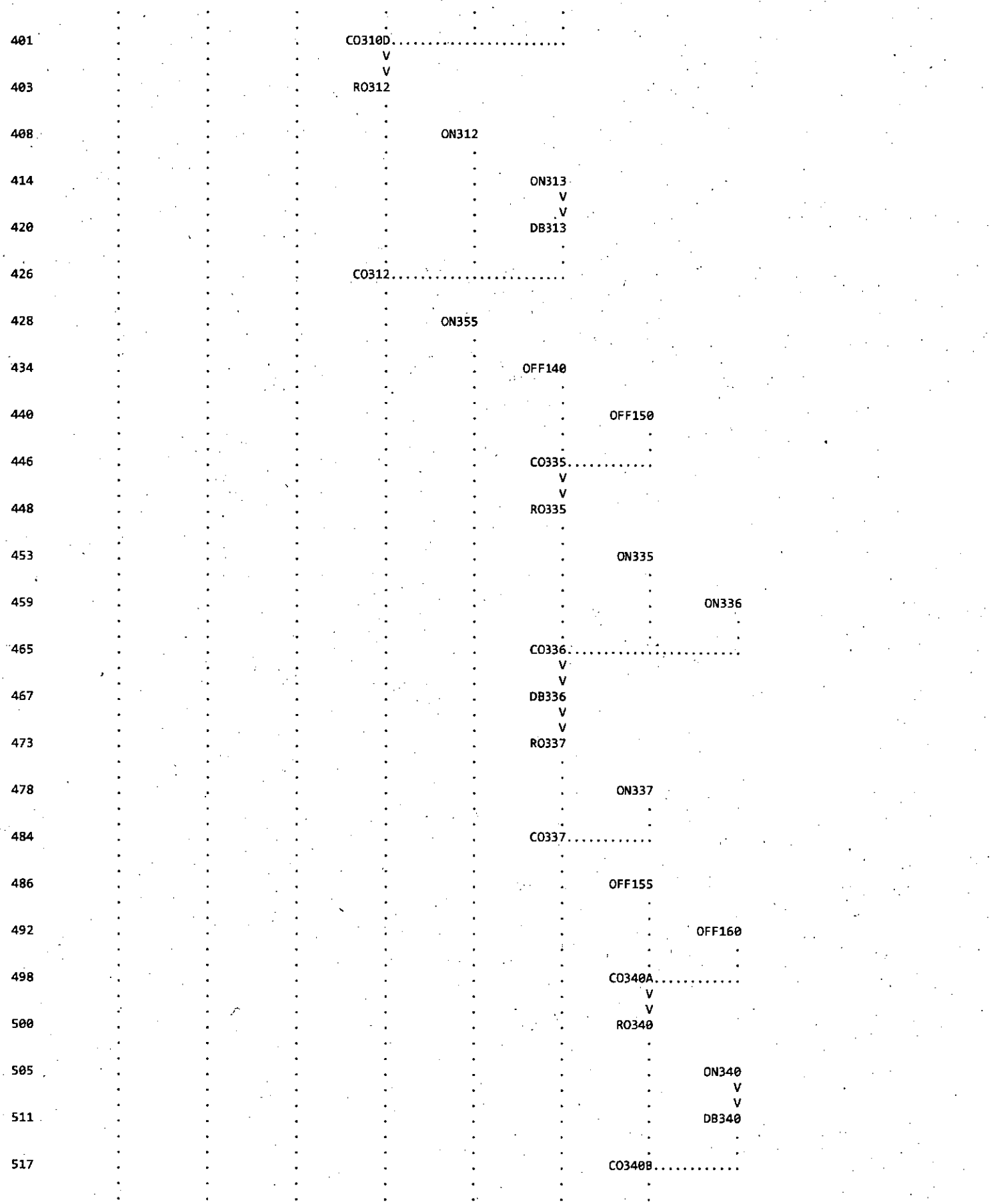
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<----) RETURN OF DIVERTED OR PUMPED FLOW
```


RO215A
OFF110
OFF115
RO220
ON220
CO220
RO215D
CO215A
RO215B
CO215B
RO215C
ON215
CO215C
RO240A
ON235
CO240A
RO240B
ON240
CO240B
RO260A
ON245
RO260B
ON260
CO260
ON265


V
148 DB270
154 ON280
160 OFF120
V
V
166 RO305A
171 OFF125
V
V
177 RO305B
182 CO305A
V
V
184 RO305C
189 ON305
195 CO305B
V
V
197 RO230B
202 ON225
V
V
208 DB225
V
V
214 RO230A
219 ON230
225 CO230
V
V
227 RO250A
232 ON320
V
V
238 RO250B
243 ON315
V
V
249 RO250C
254 CO250A
V
V
256 RO250D
261 ON250
267 CO250B
V
V
269 RO285A


274
ON330
280
RO255
285
ON255
291
CO255
293
RO285B
298
CO285A
300
RO285C
305
ON285
311
CO285B
313
ON325
319
DB325
325
RO326
330
ON326
336
CO326
338
ON360
344
CEX1
346
OFF130
352
OFF135
358
CO310A
360
RO310A
365
OFF145
371
RO310B
376
CO310B
378
RO310C
383
ON310
389
ON311


401
CO310D
V
V
403
RO312
408
ON312
414
ON313
V
V
420
DB313
426
CO312
428
ON355
434
OFF140
440
OFF150
446
CO335
V
V
448
RO335
453
ON335
459
ON336
465
CO336
V
V
467
DB336
V
V
473
RO337
478
ON337
484
CO337
486
OFF155
492
OFF160
498
CO340A
V
V
500
RO340
505
ON340
V
V
511
DB340
517
CO340B

```
                                                                                            V
  525     .        .        .        .        .        .        .        .               RO345
                                                                                          .
  530     .        .        .        .        .        .        .        .                .      ON345
                                                                                          .         .
  536     .        .        .        .        .        .        .        .               CO345...........
                                                                                          .
  538     .        .        .        .        .        .        .        .                .      ON350

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                        ****************************************
 *                                       *                                        *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                        *   U.S. ARMY CORPS OF ENGINEERS       *
 *            JUN   1998                 *                                        *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                 *                                        *        609 SECOND STREET             *
 *                                       *                                        *     DAVIS, CALIFORNIA 95616          *
 * RUN DATE   19FEB17  TIME  18:15:44    *                                        *         (916) 756-1104               *
 *                                       *                                        *                                      *
****************************************                                         ****************************************



                                   Flood Control District of Maricopa County
                                   STORYROCK PH3 PROP - STORYROCK PHASE 3 PROP CONDITION
                                   2 YEAR
                                   6 Hour  Storm
                                   Unit Hydrograph: Clark
                                   Storm: Multiple
                                   02/19/2017

    9 IO          OUTPUT CONTROL VARIABLES
                        IPRNT           5  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                         NMIN           5  MINUTES IN COMPUTATION INTERVAL
                        IDATE      1JAN99  STARTING DATE
                        ITIME        0000  STARTING TIME
                           NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      7JAN99  ENDING DATE
                       NDTIME        2235  ENDING TIME
                        ICENT          19  CENTURY MARK

                COMPUTATION INTERVAL    0.08 HOURS
                     TOTAL TIME BASE  166.58 HOURS

           ENGLISH UNITS
                DRAINAGE AREA        SQUARE MILES
                PRECIPITATION DEPTH  INCHES
                LENGTH, ELEVATION    FEET
                FLOW                 CUBIC FEET PER SECOND
                STORAGE VOLUME       ACRE-FEET
                SURFACE AREA         ACRES
                TEMPERATURE          DEGREES FAHRENHEIT

   11 JD          INDEX STORM NO. 1
                         STRM        1.42  PRECIPITATION DEPTH
                         TRDA        0.00  TRANSPOSITION DRAINAGE AREA

   12 PI            PRECIPITATION PATTERN
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                       0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                       0.03      0.03      0.05      0.05      0.05      0.15      0.15      0.15      0.03      0.03
                       0.03      0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00
                       0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                       0.00      0.00

   15 JD          INDEX STORM NO. 2
                         STRM        1.41  PRECIPITATION DEPTH
```

```
 16 PI            PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                    0.03      0.03      0.05      0.05      0.05      0.15      0.15      0.15      0.03      0.03
                    0.03      0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00

 19 JD          INDEX STORM NO. 3
                      STRM        1.38  PRECIPITATION DEPTH
                      TRDA        2.80  TRANSPOSITION DRAINAGE AREA

 20 PI            PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                    0.03      0.03      0.07      0.07      0.07      0.08      0.08      0.08      0.05      0.05
                    0.05      0.02      0.02      0.02      0.01      0.01      0.01      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
148 KK    *     DB270  *      STORAGE
          *            *
          **************

149 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
208 KK    *     DB225  *      STORAGE
          *            *
          **************

209 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
319 KK    *     DB325  *      STORAGE
          *            *
          **************

320 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
```

```
395 KK     *      DB311  *      STORAGE
           *             *
           ***************

396 KO           OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           ***************
           *             *
420 KK     *      DB313  *      STORAGE
           *             *
           ***************

421 KO           OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           ***************
           *             *
467 KK     *      DB336  *      STORAGE
           *             *
           ***************

468 KO           OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           ***************
           *             *
511 KK     *      DB340  *      STORAGE
           *             *
           ***************

512 KO           OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
1
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	OFF105	17.	4.42	3.	1.	0.	0.09		
+	ROUTED TO	RO215A	16.	4.50	3.	1.	0.	0.09		
+	HYDROGRAPH AT	OFF110	8.	4.33	1.	0.	0.	0.04		
+	HYDROGRAPH AT	OFF115	3.	4.17	0.	0.	0.	0.01		
+	ROUTED TO									

	HYDROGRAPH AT						
+		ON220	1.	4.08	0.	0.	0.	0.00
	2 COMBINED AT						
+		CO220	4.	4.17	0.	0.	0.	0.01
	ROUTED TO						
+		RO215D	4.	4.17	0.	0.	0.	0.01
	2 COMBINED AT						
+		CO215A	12.	4.25	2.	0.	0.	0.05
	ROUTED TO						
+		RO215B	11.	4.33	2.	0.	0.	0.05
	2 COMBINED AT						
+		CO215B	25.	4.42	4.	1.	0.	0.13
	ROUTED TO						
+		RO215C	25.	4.50	4.	1.	0.	0.13
	HYDROGRAPH AT						
+		ON215	10.	4.25	1.	0.	0.	0.03
	2 COMBINED AT						
+		CO215C	32.	4.42	5.	1.	0.	0.16
	ROUTED TO						
+		RO240A	31.	4.42	5.	1.	0.	0.16
	HYDROGRAPH AT						
+		ON235	1.	4.08	0.	0.	0.	0.00
	2 COMBINED AT						
+		CO240A	32.	4.42	5.	1.	0.	0.16
	ROUTED TO						
+		RO240B	32.	4.50	5.	1.	0.	0.16
	HYDROGRAPH AT						
+		ON240	2.	4.17	0.	0.	0.	0.01
	2 COMBINED AT						
+		CO240B	33.	4.50	5.	1.	0.	0.17
	ROUTED TO						
+		RO260A	33.	4.50	5.	1.	0.	0.17
	HYDROGRAPH AT						
+		ON245	1.	4.17	0.	0.	0.	0.00
	ROUTED TO						
+		RO260B	1.	4.25	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON260	1.	4.17	0.	0.	0.	0.00
	3 COMBINED AT						
+		CO260	34.	4.50	6.	1.	0.	0.17
	HYDROGRAPH AT						
+		ON265	1.	4.00	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON270	3.	4.08	0.	0.	0.	0.00
	ROUTED TO						
+		DB270	1.	4.33	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON280	1.	4.00	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		OFF120	16.	4.42	3.	1.	0.	0.09
	ROUTED TO						
+		RO305A	16.	4.50	3.	1.	0.	0.09

	HYDROGRAPH AT						
+		OFF125	18.	4.42	4.	1.	0.	0.11
	ROUTED TO						
+		RO305B	18.	4.50	4.	1.	0.	0.11
	2 COMBINED AT						
+		CO305A	34.	4.50	7.	2.	1.	0.20
	ROUTED TO						
+		RO305C	33.	4.58	7.	2.	1.	0.20
	HYDROGRAPH AT						
+		ON305	14.	4.17	1.	0.	0.	0.02
	2 COMBINED AT						
+		CO305B	37.	4.50	8.	2.	1.	0.23
	ROUTED TO						
+		RO230B	37.	4.50	8.	2.	1.	0.23
	HYDROGRAPH AT						
+		ON225	4.	4.08	0.	0.	0.	0.00
	ROUTED TO						
+		DB225	1.	4.33	0.	0.	0.	0.00
	ROUTED TO						
+		RO230A	1.	4.50	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON230	2.	4.17	0.	0.	0.	0.01
	3 COMBINED AT						
+		CO230	40.	4.50	8.	2.	1.	0.24
	ROUTED TO						
+		RO250A	40.	4.58	8.	2.	1.	0.24
	HYDROGRAPH AT						
+		ON320	0.	4.08	0.	0.	0.	0.00
	ROUTED TO						
+		RO250B	0.	4.25	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON315	5.	4.17	1.	0.	0.	0.01
	ROUTED TO						
+		RO250C	5.	4.17	1.	0.	0.	0.01
	3 COMBINED AT						
+		CO250A	41.	4.58	9.	2.	1.	0.25
	ROUTED TO						
+		RO250D	42.	4.58	9.	2.	1.	0.25
	HYDROGRAPH AT						
+		ON250	3.	4.17	0.	0.	0.	0.01
	2 COMBINED AT						
+		CO250B	43.	4.58	9.	2.	1.	0.26
	ROUTED TO						
+		RO285A	43.	4.58	9.	2.	1.	0.26
	HYDROGRAPH AT						
+		ON330	0.	4.08	0.	0.	0.	0.00
	ROUTED TO						
+		RO255	0.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON255	1.	4.08	0.	0.	0.	0.00
	2 COMBINED AT						
+		CO255	1.	4.17	0.	0.	0.	0.00

+	RO285B	1.	4.17	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO285A	43.	4.58	9.	2.	1.	0.26
	ROUTED TO						
+	RO285C	42.	4.67	9.	2.	1.	0.26
	HYDROGRAPH AT						
+	ON285	5.	4.08	0.	0.	0.	0.01
	2 COMBINED AT						
+	CO285B	43.	4.58	10.	2.	1.	0.27
	HYDROGRAPH AT						
+	ON325	4.	4.08	0.	0.	0.	0.01
	ROUTED TO						
+	DB325	1.	4.50	0.	0.	0.	0.01
	ROUTED TO						
+	RO326	1.	4.58	0.	0.	0.	0.01
	HYDROGRAPH AT						
+	ON326	4.	4.17	0.	0.	0.	0.01
	2 COMBINED AT						
+	CO326	4.	4.17	1.	0.	0.	0.01
	HYDROGRAPH AT						
+	ON360	0.	4.08	0.	0.	0.	0.00
	5 COMBINED AT						
+	CEX1	47.	4.58	11.	3.	1.	0.29
	HYDROGRAPH AT						
+	OFF130	6.	4.25	1.	0.	0.	0.02
	HYDROGRAPH AT						
+	OFF135	8.	4.42	2.	0.	0.	0.06
	2 COMBINED AT						
+	CO310A	12.	4.42	2.	1.	0.	0.08
	ROUTED TO						
+	RO310A	12.	4.42	2.	1.	0.	0.08
	HYDROGRAPH AT						
+	OFF145	1.	4.17	0.	0.	0.	0.00
	ROUTED TO						
+	RO310B	1.	4.25	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO310B	13.	4.42	2.	1.	0.	0.08
	ROUTED TO						
+	RO310C	12.	4.50	2.	1.	0.	0.08
	HYDROGRAPH AT						
+	ON310	7.	4.25	1.	0.	0.	0.02
	HYDROGRAPH AT						
+	ON311	8.	4.17	1.	0.	0.	0.01
	ROUTED TO						
+	DB311	3.	4.58	1.	0.	0.	0.01
	3 COMBINED AT						
+	CO310D	21.	4.42	4.	1.	0.	0.11
	ROUTED TO						
+	RO312	20.	4.50	4.	1.	0.	0.11
	HYDROGRAPH AT						
+	ON312	2.	4.08	0.	0.	0.	0.00

	ROUTED TO						
+	DB313	1.	4.58	0.	0.	0.	0.00
	3 COMBINED AT						
+	CO312	22.	4.42	4.	1.	0.	0.12
	HYDROGRAPH AT						
+	ON355	1.	4.00	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	OFF140	8.	4.33	1.	0.	0.	0.04
	HYDROGRAPH AT						
+	OFF150	1.	4.17	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO335	9.	4.33	1.	0.	0.	0.04
	ROUTED TO						
+	RO335	9.	4.33	1.	0.	0.	0.04
	HYDROGRAPH AT						
+	ON335	1.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	ON336	6.	4.08	0.	0.	0.	0.01
	3 COMBINED AT						
+	CO336	11.	4.25	2.	0.	0.	0.05
	ROUTED TO						
+	DB336	8.	4.58	2.	0.	0.	0.05
	ROUTED TO						
+	RO337	8.	4.58	2.	0.	0.	0.05
	HYDROGRAPH AT						
+	ON337	4.	4.17	1.	0.	0.	0.01
	2 COMBINED AT						
+	CO337	10.	4.42	2.	1.	0.	0.06
	HYDROGRAPH AT						
+	OFF155	1.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	OFF160	6.	4.42	1.	0.	0.	0.04
	2 COMBINED AT						
+	CO340A	6.	4.42	1.	0.	0.	0.04
	ROUTED TO						
+	RO340	6.	4.42	1.	0.	0.	0.04
	HYDROGRAPH AT						
+	ON340	6.	4.17	1.	0.	0.	0.01
	ROUTED TO						
+	DB340	2.	4.58	1.	0.	0.	0.01
	2 COMBINED AT						
+	CO340B	8.	4.42	2.	0.	0.	0.05
	HYDROGRAPH AT						
+	OFF165	1.	4.08	0.	0.	0.	0.00
	ROUTED TO						
+	RO345	1.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	ON345	0.	4.17	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO345	2.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						

*** NORMAL END OF HEC-1 ***

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998               *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   19FEB17  TIME  18:15:58  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

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

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1           ID      } Flood Control District of Maricopa County
  2           ID        STORYROCK PH3 PROP - STORYROCK PHASE 3 PROP CONDITION
  3           ID        10 YEAR
  4           ID        6 Hour  Storm
  5           ID        Unit Hydrograph: Clark
  6           ID        Storm: Multiple
  7           ID        02/19/2017
              *DIAGRAM
  8           IT      5  1JAN99       0    2000
  9           IO      5
 10           IN     15
              *   |
 11           JD  2.105  0.0001
 12           PC  0.000   0.008  0.016  0.025  0.033  0.041  0.050  0.058  0.066  0.074
 13           PC  0.087   0.099  0.118  0.138  0.216  0.377  0.834  0.911  0.931  0.950
 14           PC  0.962   0.972  0.983  0.991  1.000
 15           JD  2.092  0.5000
 16           PC  0.000   0.008  0.016  0.025  0.033  0.041  0.050  0.058  0.066  0.074
 17           PC  0.087   0.099  0.118  0.138  0.216  0.377  0.834  0.911  0.931  0.950
 18           PC  0.962   0.972  0.983  0.991  1.000
 19           JD  2.052     2.8
 20           PC  0.000   0.009  0.016  0.025  0.034  0.042  0.051  0.059  0.067  0.076
 21           PC  0.087   0.100  0.120  0.163  0.252  0.451  0.694  0.837  0.900  0.938
 22           PC  0.950   0.963  0.975  0.988  1.000
              *
 23           KK  OFF105   BASIN
 24           BA  0.085
 25           LG   0.35    0.40   6.00   0.18      0
 26           UC  0.447   0.552
 27           UA      0     3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
 28           UA    100
              *
 29           KK  RO215A   ROUTE
 30           RS      1    FLOW
 31           RC  0.050   0.035  0.050    975 0.0360   0.00
 32           RX   0.00    9.00  21.00  25.00  32.00  36.00  70.00  90.00
 33           RY   2.00    0.50   1.00   0.00   0.00   1.00   0.00   2.00
              *
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          34          KK  OFF110   BASIN
          35          BA   0.037
          36          LG    0.35    0.40    6.00    0.18       0
          37          UC   0.356   0.484
          38          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          39          UA     100
                      *

          40          KK  OFF115   BASIN
          41          BA   0.007
          42          LG    0.35    0.40    6.00    0.18       0
          43          UC   0.189   0.192
          44          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          45          UA     100
                      *
1                                          HEC-1 INPUT                                          PAGE  2

        LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          46          KK   RO220   ROUTE
          47          RS       1    FLOW
          48          RC   0.050   0.035   0.050     310  0.0420    0.00
          49          RX    0.00    8.00   15.00   21.00   21.10   25.00   30.00   36.00
          50          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
                      *

          51          KK   ON220   BASIN
          52          BA   0.002
          53          LG    0.30    0.25    6.00    0.17      17
          54          UC   0.116   0.200
          55          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          56          UA     100
                      *

          57          KK   CO220 COMBINE
          58          HC       2
                      *

          59          KK  RO215D   ROUTE
          60          RS       1    FLOW
          61          RC   0.050   0.035   0.050     364  0.0300    0.00
          62          RX    0.00    5.00    8.00   11.00   11.10   14.00   17.00   24.00
          63          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                      *

          64          KK  CO215A COMBINE
          65          HC       2
                      *

          66          KK  RO215B   ROUTE
          67          RS       1    FLOW
          68          RC   0.050   0.035   0.050     800  0.0340    0.00
          69          RX    0.00    6.00   10.00   13.00   19.00   21.00   26.00   62.00
          70          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
                      *

          71          KK  CO215B COMBINE
          72          HC       2
                      *

          73          KK  RO215C   ROUTE
          74          RS       1    FLOW
          75          RC   0.050   0.035   0.050     445  0.0340    0.00
          76          RX    0.00   12.00   28.00   36.00   48.00   71.00   73.00   76.00
          77          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
                      *

          78          KK   ON215   BASIN
          79          BA   0.030
          80          LG    0.35    0.40    6.00    0.18       0
          81          UC   0.290   0.278
          82          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          83          UA     100
                      *
1                                          HEC-1 INPUT                                          PAGE  3

        LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
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```
 84          KK  CO215C COMBINE
 85          HC       2
             *

 86          KK  RO240A   ROUTE
 87          RS       1    FLOW
 88          RC   0.050   0.035   0.050     245  0.0370    0.00
 89          RX    0.00    5.00   10.00   14.00   32.00   41.00   48.00   52.00
 90          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

 91          KK   ON235   BASIN
 92          BA   0.002
 93          LG    0.35    0.40    6.00    0.18       0
 94          UC   0.146   0.181
 95          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 96          UA     100
             *

 97          KK  CO240A COMBINE
 98          HC       2
             *

 99          KK  RO240B   ROUTE
100          RS       1    FLOW
101          RC   0.050   0.035   0.050     465  0.0390    0.00
102          RX    0.00    7.00   19.00   49.00   65.00   70.00   77.00   85.00
103          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

104          KK   ON240   BASIN
105          BA   0.007
106          LG    0.35    0.40    6.00    0.18       0
107          UC   0.229   0.309
108          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
109          UA     100
             *

110          KK  CO240B COMBINE
111          HC       2
             *

112          KK  RO260A   ROUTE
113          RS       1    FLOW
114          RC   0.050   0.035   0.050     225  0.0360    0.00
115          RX    0.00    7.00   15.00   26.00   29.00   34.00   42.00   50.00
116          RY    2.00    1.00    0.00    0.00    1.00    1.00    0.50    1.00
             *
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117          KK   ON245   BASIN
118          BA   0.003
119          LG    0.35    0.40    6.00    0.18       0
120          UC   0.191   0.296
121          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
122          UA     100
             *

123          KK  RO260B   ROUTE
124          RS       1    FLOW
125          RC   0.050   0.035   0.050     361  0.0280    0.00
126          RX    0.00   23.00   44.00   69.00   70.00   85.00   92.00  104.00
127          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

128          KK   ON260   BASIN
129          BA   0.002
130          LG    0.35    0.40    6.00    0.18       0
131          UC   0.180   0.277
132          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
133          UA     100
             *

134          KK  CO260 COMBINE
```

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                  *

  136             KK   ON265   BASIN
  137             BA   0.001
  138             LG    0.30    0.25    6.00    0.22      27
  139             UC   0.087   0.133
  140             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  141             UA     100
                  *

  142             KK   ON270   BASIN
  143             BA   0.004
  144             LG    0.30    0.25    6.00    0.22      27
  145             UC   0.144   0.231
  146             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  147             UA     100
                  *

  148             KK   DB270 STORAGE
  149             KO
  150             RS       1    STOR
  151             SV            0.04    0.08    0.12    0.16    0.20    0.24    0.24
  152             SQ                    1.00    1.00    2.00    2.00    3.00    7.00
  153             SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
                  *
1                                             HEC-1 INPUT                                              PAGE  5

 LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


  154             KK   ON280   BASIN
  155             BA   0.001
  156             LG    0.30    0.25    6.00    0.22      27
  157             UC   0.082   0.090
  158             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  159             UA     100
                  *

  160             KK  OFF120   BASIN
  161             BA   0.095
  162             LG    0.35    0.40    6.00    0.18       0
  163             UC   0.470   0.671
  164             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  165             UA     100
                  *

  166             KK  RO305A   ROUTE
  167             RS       1    FLOW
  168             RC   0.050   0.035   0.050     685  0.0480    0.00
  169             RX    0.00   10.00   21.00   30.00   43.00   61.00   68.00   75.00
  170             RY    3.00    2.00    1.00    0.00    0.00    1.00    0.00    1.00
                  *

  171             KK  OFF125   BASIN
  172             BA   0.109
  173             LG    0.35    0.40    6.00    0.18       2
  174             UC   0.495   0.722
  175             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
  176             UA     100
                  *

  177             KK  RO305B   ROUTE
  178             RS       1    FLOW
  179             RC   0.050   0.035   0.050     970  0.0480    0.00
  180             RX    0.00    6.00    8.00   20.00   32.00   43.00   51.00   66.00
  181             RY    3.00    2.00    1.00    0.00    0.00    1.00    1.50    2.00
                  *

  182             KK  CO305A COMBINE
  183             HC       2
                  *

  184             KK  RO305C   ROUTE
  185             RS       1    FLOW
  186             RC   0.050   0.035   0.050     653  0.0430    0.00
  187             RX    0.00   10.00   15.00   26.00   43.00  155.00  165.00  169.00
  188             RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                  *
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 189      KK   ON305   BASIN
 190      BA   0.023
 191      LG    0.30    0.29    6.00    0.18      15
 192      UC   0.215   0.237
 193      UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 194      UA     100
          *

 195      KK  CO305B COMBINE
 196      HC       2
          *

 197      KK  RO230B   ROUTE
 198      RS       1    FLOW
 199      RC   0.050   0.035   0.050     270  0.0480    0.00
 200      RX    0.00    9.00   30.00   45.00  118.00  122.00  127.00  132.00
 201      RY    2.00    1.00    0.50    0.00    0.00    1.00    2.00    3.00
          *

 202      KK   ON225   BASIN
 203      BA   0.005
 204      LG    0.30    0.25    6.00    0.19      19
 205      UC   0.134   0.169
 206      UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 207      UA     100
          *

 208      KK   DB225 STORAGE
 209      KO
 210      RS       1    STOR
 211      SV            0.07    0.15    0.22    0.32    0.42    0.53
 212      SQ            1.00    3.00    4.00    5.00    5.00    6.00
 213      SE            0.50    1.00    1.50    2.00    2.50    3.00
          *

 214      KK  RO230A   ROUTE
 215      RS       1    FLOW
 216      RC   0.050   0.035   0.050     770  0.0340    0.00
 217      RX    0.00   10.00   20.00   35.00   51.00   61.00   68.00   73.00
 218      RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
          *

 219      KK   ON230   BASIN
 220      BA   0.007
 221      LG    0.35    0.40    6.00    0.18       0
 222      UC   0.230   0.283
 223      UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 224      UA     100
          *

1                                        HEC-1 INPUT                                    PAGE  7

LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 225      KK   CO230 COMBINE
 226      HC       3
          *

 227      KK  RO250A   ROUTE
 228      RS       1    FLOW
 229      RC   0.050   0.035   0.050     433  0.0420    0.00
 230      RX    0.00    8.00   17.00   25.00   47.00   51.00   58.00   62.00
 231      RY    2.00    1.00    0.50    0.00    0.00    0.50    0.75    1.00
          *

 232      KK   ON320   BASIN
 233      BA   0.001
 234      LG    0.35    0.40    6.00    0.18       0
 235      UC   0.147   0.205
 236      UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 237      UA     100
          *
```

```
240          RC   0.050   0.035   0.050     650  0.0400    0.00
241          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
242          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

243          KK   ON315   BASIN
244          BA   0.009
245          LG    0.31    0.28    6.00    0.17      13
246          UC   0.178   0.238
247          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
248          UA     100
             *

249          KK  RO250C   ROUTE
250          RS       1    FLOW
251          RC   0.050   0.035   0.050     402  0.0350    0.00
252          RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
253          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

254          KK  CO250A COMBINE
255          HC       3
             *

256          KK  RO250D   ROUTE
257          RS       1    FLOW
258          RC   0.050   0.035   0.050     271  0.0410    0.00
259          RX    0.00   34.00   60.00   71.00   81.00  110.00  121.00  134.00
260          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *
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1 HEC-1 INPUT PAGE 8

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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

261          KK   ON250   BASIN
262          BA   0.009
263          LG    0.35    0.40    6.00    0.18       0
264          UC   0.230   0.269
265          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
266          UA     100
             *

267          KK  CO250B COMBINE
268          HC       2
             *

269          KK  RO285A   ROUTE
270          RS       1    FLOW
271          RC   0.050   0.035   0.050     378  0.0420    0.00
272          RX    0.00   34.00   64.00   88.00  110.00  115.00  118.00  120.00
273          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

274          KK   ON330   BASIN
275          BA   0.001
276          LG    0.35    0.40    6.00    0.18       0
277          UC   0.137   0.221
278          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
279          UA     100
             *

280          KK   RO255   ROUTE
281          RS       1    FLOW
282          RC   0.050   0.035   0.050     213  0.0470    0.00
283          RX    0.00    6.00   11.00   18.00   18.10   27.00   35.00   40.00
284          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

285          KK   ON255   BASIN
286          BA   0.002
287          LG    0.35    0.40    6.00    0.18       0
288          UC   0.146   0.180
289          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
290          UA     100
             *

291          KK  CO255 COMBINE
```

```
                *
293             KK  RO285B   ROUTE
294             RS       1    FLOW
295             RC   0.050   0.035   0.050     543  0.0370    0.00
296             RX    0.00   12.00   12.00   14.00   14.10   19.00   24.00   28.00
297             RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *
1                                       HEC-1 INPUT                                 PAGE  9

LINE            ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10


298             KK  CO285A COMBINE
299             HC       2
                *

300             KK  RO285C   ROUTE
301             RS       1    FLOW
302             RC   0.050   0.035   0.050     315  0.0410    0.00
303             RX    0.00    8.00   15.00   22.00  149.00  169.00  178.00  182.00
304             RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *

305             KK   ON285   BASIN
306             BA   0.009
307             LG    0.32    0.31    6.00    0.17      11
308             UC   0.175   0.198
309             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
310             UA     100
                *

311             KK  CO285B COMBINE
312             HC       2
                *

313             KK   ON325   BASIN
314             BA   0.006
315             LG    0.31    0.28    6.00    0.17      14
316             UC   0.157   0.222
317             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
318             UA     100
                *

319             KK   DB325 STORAGE
320             KO
321             RS       1    STOR
322             SV            0.05    0.10    0.15    0.20    0.25    0.30    0.30
323             SQ                    1.00    2.00    2.00    3.00    3.00   11.00
324             SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
                *

325             KK   RO326   ROUTE
326             RS       1    FLOW
327             RC   0.050   0.035   0.050     963  0.0370    0.00
328             RX    0.00   10.00   13.00   16.00   16.50   19.00   20.00   22.00
329             RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *

330             KK   ON326   BASIN
331             BA   0.007
332             LG    0.31    0.29    6.00    0.17      12
333             UC   0.202   0.305
334             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
335             UA     100
                *
1                                       HEC-1 INPUT                                 PAGE 10

LINE            ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10


336             KK   CO326 COMBINE
337             HC       2
                *

338             KK   ON360   BASIN
339             BA   0.001
340             LG    0.35    0.40    6.00    0.18       0
```

```
 342          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 343          UA     100
              *

 344          KK     CEX1 COMBINE
 345          HC        5
              *

 346          KK   OFF130   BASIN
 347          BA    0.018
 348          LG     0.35    0.40    6.00    0.18       0
 349          UC    0.253   0.279
 350          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 351          UA     100
              *

 352          KK   OFF135   BASIN
 353          BA    0.057
 354          LG     0.35    0.40    6.00    0.18       0
 355          UC    0.480   0.865
 356          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 357          UA     100
              *

 358          KK   CO310A COMBINE
 359          HC        2
              *

 360          KK   RO310A   ROUTE
 361          RS        1    FLOW
 362          RC    0.050   0.035   0.050    1060  0.0420    0.00
 363          RX     0.00    8.00   20.00   32.00   36.00   42.00   46.00   50.00
 364          RY     3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

 365          KK   OFF145   BASIN
 366          BA    0.004
 367          LG     0.35    0.40    6.00    0.18       0
 368          UC    0.192   0.269
 369          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 370          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 371          KK   RO310B   ROUTE
 372          RS        1    FLOW
 373          RC    0.050   0.035   0.050     850  0.0470    0.00
 374          RX     0.00    6.00    8.00   10.00   12.00   14.00   15.00   19.00
 375          RY     4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
              *

 376          KK   CO310B COMBINE
 377          HC        2
              *

 378          KK   RO310C   ROUTE
 379          RS        1    FLOW
 380          RC    0.050   0.035   0.050    1000  0.0450    0.00
 381          RX     0.00    4.00    8.00   16.00   20.00   22.00   24.00   26.00
 382          RY     3.00    2.50    2.00    0.00    0.00    2.00    3.00    4.00
              *

 383          KK    ON310   BASIN
 384          BA    0.018
 385          LG     0.31    0.28    6.00    0.18      15
 386          UC    0.257   0.450
 387          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 388          UA     100
              *

 389          KK    ON311   BASIN
 390          BA    0.015
 391          LG     0.30    0.26    6.00    0.19      17
 392          UC    0.208   0.313
```

```
                *
395             KK   DB311 STORAGE
396             KO
397             RS       1    STOR
398             SV            0.12    0.21    0.32    0.45    0.60    0.74    0.74
399             SQ                    2.00    5.00    7.00    9.00   11.00   23.00
400             SE            0.50    1.00    1.50    2.00    2.50    3.00    3.01
                *

401             KK  CO310D COMBINE
402             HC       3
                *

403             KK   RO312   ROUTE
404             RS       1    FLOW
405             RC   0.050   0.035   0.050     675  0.0410    0.00
406             RX    0.00    4.00    6.00   10.00   12.00   24.00   74.00   83.00
407             RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
                *
1                                       HEC-1 INPUT                             PAGE 12

LINE            ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

408             KK   ON312   BASIN
409             BA   0.004
410             LG    0.32    0.31    6.00    0.17      10
411             UC   0.159   0.232
412             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
413             UA     100
                *

414             KK   ON313   BASIN
415             BA   0.004
416             LG    0.29    0.36    6.00    0.20      15
417             UC   0.200   0.316
418             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
419             UA     100
                *

420             KK   DB313 STORAGE
421             KO
422             RS       1    STOR
423             SV            0.04    0.08    0.12    0.18    0.23    0.30
424             SQ                    1.00    1.00    1.00    2.00    2.00
425             SE            0.50    1.00    1.50    2.00    2.50    3.00
                *

426             KK   CO312 COMBINE
427             HC       3
                *

428             KK   ON355   BASIN
429             BA   0.001
430             LG    0.30    0.25    6.00    0.17      17
431             UC   0.084   0.110
432             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
433             UA     100
                *

434             KK  OFF140   BASIN
435             BA   0.035
436             LG    0.35    0.40    6.00    0.18       0
437             UC   0.351   0.464
438             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
439             UA     100
                *

440             KK  OFF150   BASIN
441             BA   0.004
442             LG    0.35    0.40    6.00    0.18       0
443             UC   0.203   0.304
444             UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
445             UA     100
                *
1                                       HEC-1 INPUT                             PAGE 13
```

```
446          KK   CO335 COMBINE
447          HC      2
             *

448          KK   RO335   ROUTE
449          RS      1    FLOW
450          RC  0.050   0.035   0.050     688  0.0420    0.00
451          RX   0.00    2.00    4.00    6.00    6.10   10.00   12.00   15.00
452          RY   3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

453          KK   ON335   BASIN
454          BA  0.002
455          LG   0.33    0.33    6.00    0.17       9
456          UC  0.185   0.475
457          UA      0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
458          UA    100
             *

459          KK   ON336   BASIN
460          BA  0.007
461          LG   0.31    0.27    6.00    0.19      16
462          UC  0.137   0.126
463          UA      0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
464          UA    100
             *

465          KK   CO336 COMBINE
466          HC      3
             *

467          KK   DB336 STORAGE
468          KO
469          RS      1    STOR
470          SV           0.16    0.32    0.49    0.68    0.67    1.08    1.08
471          SQ           6.00   10.00   18.00   28.00   35.00   45.00   66.00
472          SE           0.50    1.00    1.50    2.00    2.50    2.95    3.00
             *

473          KK   RO337   ROUTE
474          RS      1    FLOW
475          RC  0.050   0.035   0.050     467  0.0470    0.00
476          RX   0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
477          RY   5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
             *

478          KK   ON337   BASIN
479          BA  0.009
480          LG   0.31    0.27    6.00    0.18      17
481          UC  0.224   0.373
482          UA      0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
483          UA    100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

484          KK   CO337 COMBINE
485          HC      2
             *

486          KK  OFF155   BASIN
487          BA  0.004
488          LG   0.35    0.40    6.00    0.18       0
489          UC  0.214   0.359
490          UA      0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
491          UA    100
             *

492          KK  OFF160   BASIN
493          BA  0.035
494          LG   0.35    0.40    6.00    0.18       0
495          UC  0.418   0.746
496          UA      0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
497          UA    100
```

```
          498          KK  CO340A COMBINE
          499          HC       2
                       *

          500          KK   RO340   ROUTE
          501          RS       1    FLOW
          502          RC   0.050   0.035   0.050     820  0.0420    0.00
          503          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
          504          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
                       *

          505          KK   ON340   BASIN
          506          BA   0.011
          507          LG    0.31    0.28    6.00    0.17      14
          508          UC   0.183   0.242
          509          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          510          UA     100
                       *

          511          KK   DB340 STORAGE
          512          KO
          513          RS       1    STOR
          514          SV            0.10    0.20    0.31    0.43    0.55    0.70    0.70
          515          SQ            1.00    2.00    3.00    4.00    5.00    6.00   11.00
          516          SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
                       *

          517          KK  CO340B COMBINE
          518          HC       2
                       *
1                                           HEC-1 INPUT                                                  PAGE 15

         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          519          KK  OFF165   BASIN
          520          BA   0.003
          521          LG    0.35    0.40    6.00    0.18       0
          522          UC   0.151   0.165
          523          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          524          UA     100
                       *

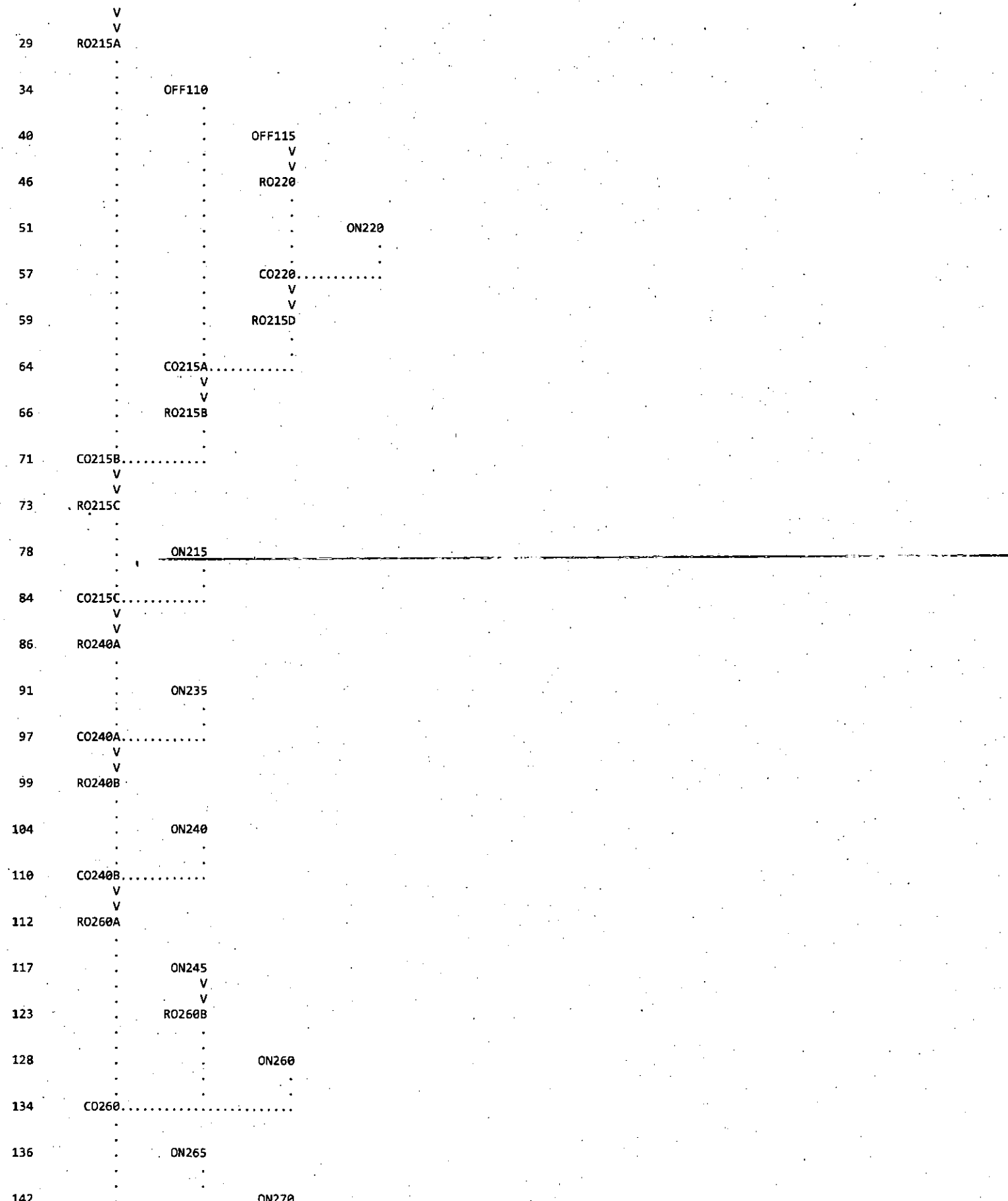
          525          KK   RO345   ROUTE
          526          RS       1    FLOW
          527          RC   0.050   0.035   0.050     490  0.0490    0.00
          528          RX    0.00    6.00   10.00   12.00   12.10   15.00   17.00   21.00
          529          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
                       *

          530          KK   ON345   BASIN
          531          BA   0.002
          532          LG    0.35    0.40    6.00    0.18       0
          533          UC   0.207   0.463
          534          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          535          UA     100
                       *

          536          KK   CO345 COMBINE
          537          HC       2
                       *

          538          KK   ON350   BASIN
          539          BA   0.001
          540          LG    0.33    0.33    6.00    0.17       9
          541          UC   0.111   0.174
          542          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
          543          UA     100
                       *
          544          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING            (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR          (<---) RETURN OF DIVERTED OR PUMPED FLOW
```


RO215A
OFF110
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RO220
ON220
CO220
RO215D
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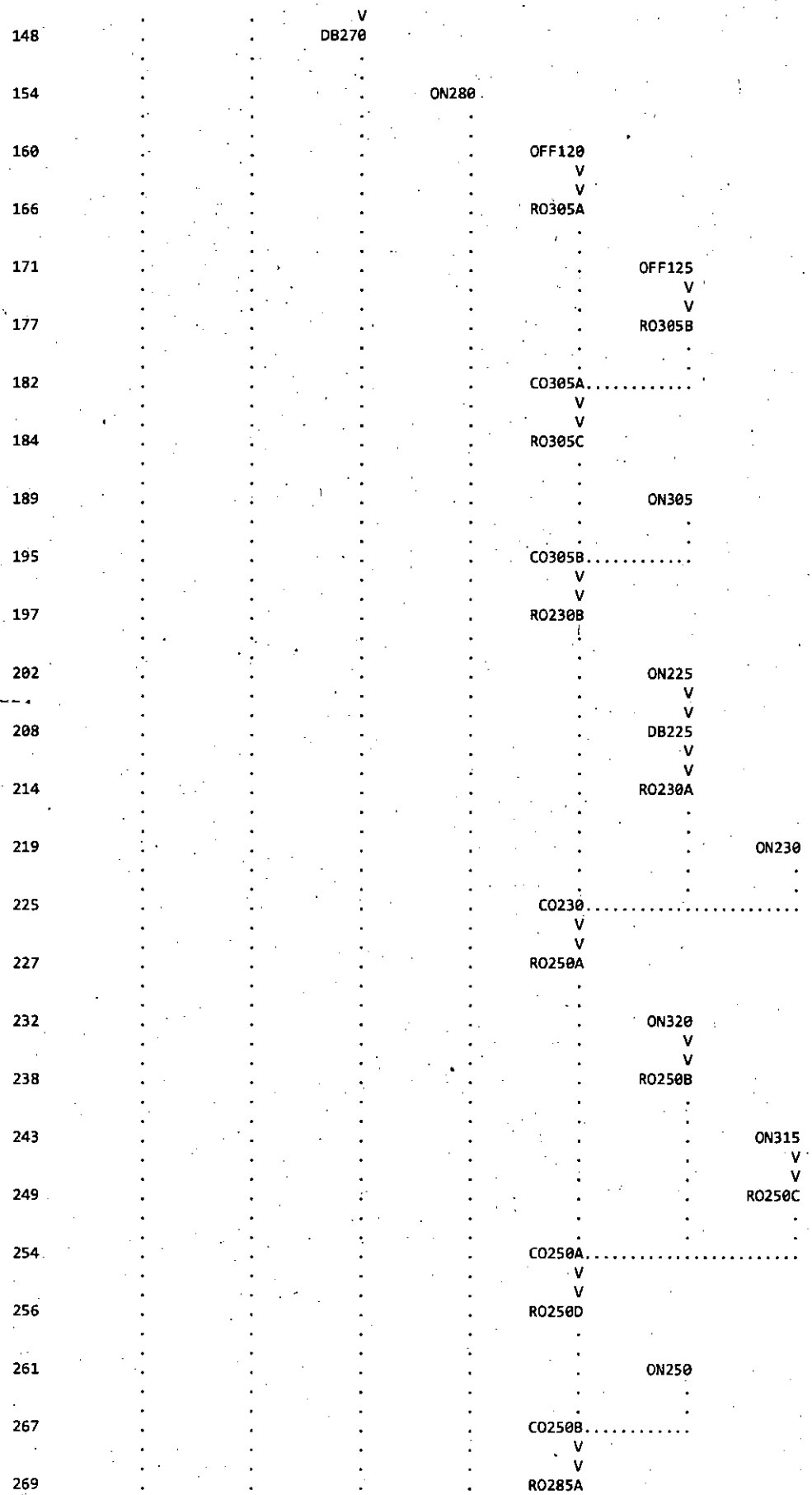
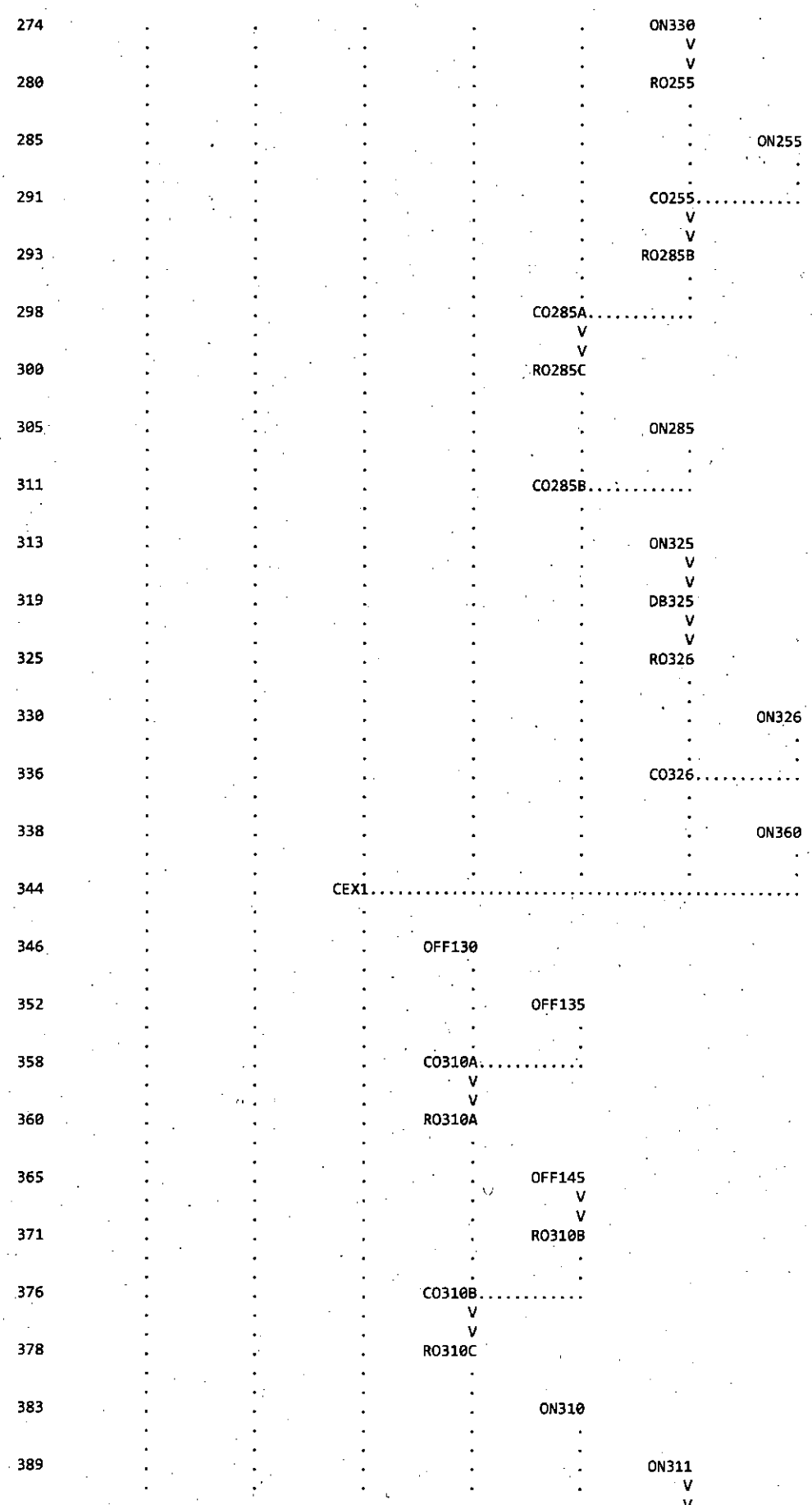
RO215B
CO215B
RO215C
ON215
CO215C
RO240A
ON235
CO240A
RO240B
ON240
CO240B
RO260A
ON245
RO260B
ON260
CO260
ON265
ON270


148 DB270
154 ON280
160 OFF120
166 RO305A
171 OFF125
177 RO305B
182 CO305A
184 RO305C
189 ON305
195 CO305B
197 RO230B
202 ON225
208 DB225
214 RO230A
219 ON230
225 CO230
227 RO250A
232 ON320
238 RO250B
243 ON315
249 RO250C
254 CO250A
256 RO250D
261 ON250
267 CO250B
269 RO285A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RO255
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ON255
291
CO255
293
RO285B
298
CO285A
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RO285C
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ON285
311
CO285B
313
ON325
319
DB325
325
RO326
330
ON326
336
CO326
338
ON360
344
CEX1
346
OFF130
352
OFF135
358
CO310A
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RO310A
365
OFF145
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RO310B
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CO310B
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RO310C
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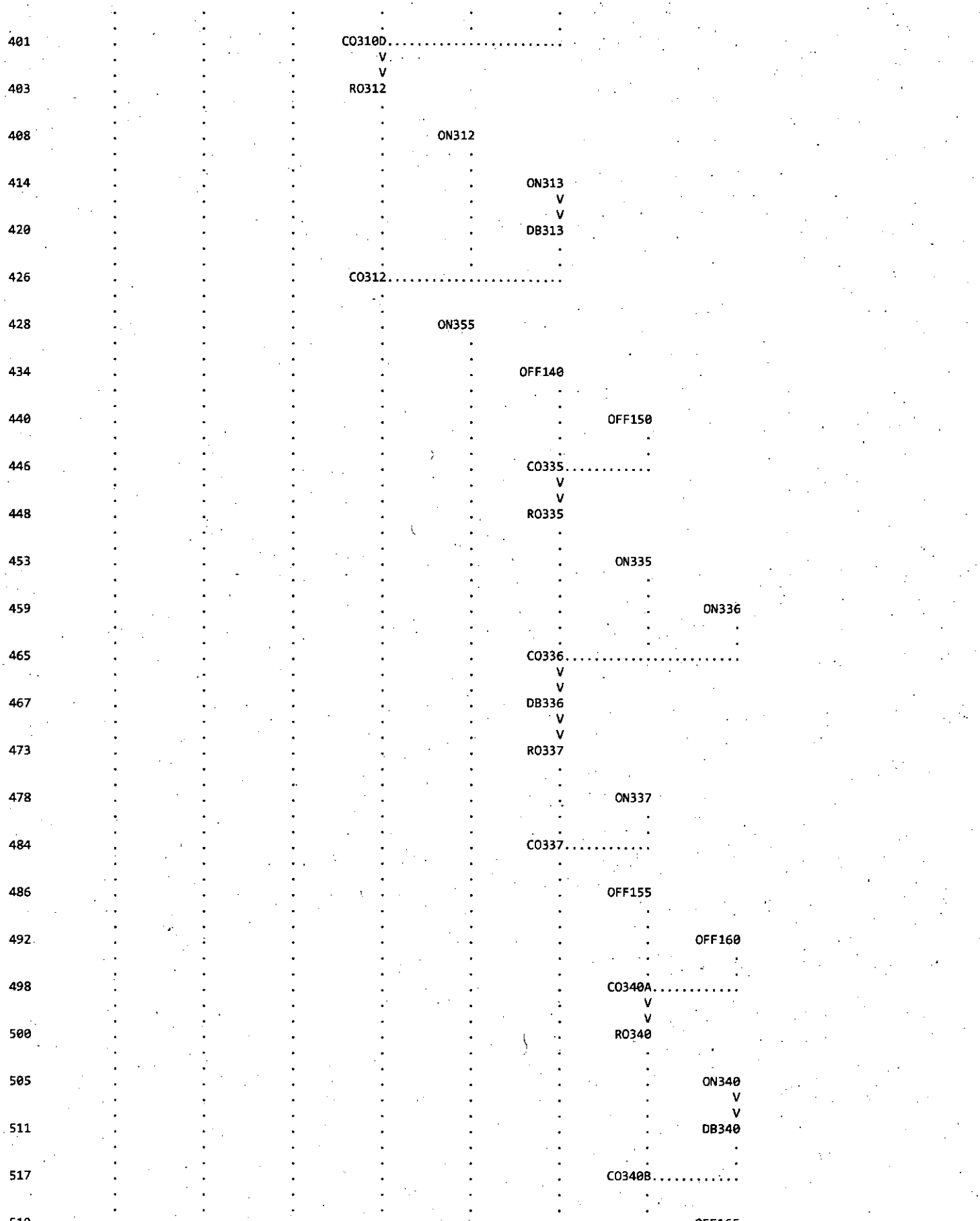
ON310
389
ON311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CO310D
403
RO312
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ON312
414
ON313
420
DB313
426
CO312
428
ON355
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OFF150
446
CO335
448
RO335
453
ON335
459
ON336
465
CO336
467
DB336
473
RO337
478
ON337
484
CO337
486
OFF155
492
OFF160
498
CO340A
500
RO340
505
ON340
511
DB340
517
CO340B

```
                                                                                                   V
  525         .         .         .         .         .         .         .         .        R0345
              .         .         .         .         .         .         .         .          .
  530         .         .         .         .         .         .         .         .          .         ON345
              .         .         .         .         .         .         .         .          .           .
  536         .         .         .         .         .         .         .         .        C0345............
              .         .         .         .         .         .         .         .          .
  538         .         .         .         .         .         .         .         .          .         ON350

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                           ****************************************
 *                                       *                                           *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                           *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998               *                                           *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1                *                                           *         609 SECOND STREET            *
 *                                       *                                           *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   19FEB17  TIME  18:15:58   *                                           *          (916) 756-1104              *
 *                                       *                                           *                                      *
 *****************************************                                           ****************************************


                                Flood Control District of Maricopa County
                                STORYROCK PH3 PROP - STORYROCK PHASE 3 PROP CONDITION
                                10 YEAR
                                6 Hour  Storm
                                Unit Hydrograph: Clark
                                Storm: Multiple
                                02/19/2017

   9 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE     1JAN99  STARTING DATE
                       ITIME       0000  STARTING TIME
                          NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE     7JAN99  ENDING DATE
                      NDTIME       2235  ENDING TIME
                       ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL    0.08 HOURS
                      TOTAL TIME BASE  166.58 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT

  11 JD          INDEX STORM NO. 1
                        STRM       2.11  PRECIPITATION DEPTH
                        TRDA       0.00  TRANSPOSITION DRAINAGE AREA

  12 PI            PRECIPITATION PATTERN
                    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
                    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
                    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
                    0.00     0.00     0.00     0.01     0.01     0.01     0.01     0.01     0.01     0.03
                    0.03     0.03     0.05     0.05     0.05     0.15     0.15     0.15     0.03     0.03
                    0.03     0.01     0.01     0.01     0.01     0.01     0.01     0.00     0.00     0.00
                    0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00
                    0.00     0.00

  15 JD          INDEX STORM NO. 2
                        STRM       2.09  PRECIPITATION DEPTH
                        TRDA       0.50  TRANSPOSITION DRAINAGE AREA
```

```
 16 PI            PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                    0.03      0.03      0.05      0.05      0.05      0.15      0.15      0.15      0.03      0.03
                    0.03      0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00

 19 JD          INDEX STORM NO. 3
                      STRM        2.05  PRECIPITATION DEPTH
                      TRDA        2.80  TRANSPOSITION DRAINAGE AREA

 20 PI            PRECIPITATION PATTERN
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                    0.03      0.03      0.07      0.07      0.07      0.08      0.08      0.08      0.05      0.05
                    0.05      0.02      0.02      0.02      0.01      0.01      0.01      0.00      0.00      0.00
                    0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                    0.00      0.00

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
148 KK      *     DB270  *      STORAGE
            *            *
            **************

149 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
208 KK      *     DB225  *      STORAGE
            *            *
            **************

209 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
319 KK      *     DB325  *      STORAGE
            *            *
            **************

320 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
```

```
395 KK      *     DB311  *      STORAGE
            *            *
            **************

396 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
420 KK      *     DB313  *      STORAGE
            *            *
            **************

421 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
467 KK      *     DB336  *      STORAGE
            *            *
            **************

468 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
511 KK      *     DB340  *      STORAGE
            *            *
            **************

512 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
1
                                        RUNOFF SUMMARY
                                  FLOW IN CUBIC FEET PER SECOND
                                 TIME IN HOURS,  AREA IN SQUARE MILES

                                      PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
          OPERATION       STATION     FLOW    PEAK                                           AREA      STAGE     MAX STAGE
+                                                          6-HOUR      24-HOUR     72-HOUR

          HYDROGRAPH AT
+                         OFF105       49.    4.33          7.          2.          1.       0.09

          ROUTED TO
+                         RO215A       46.    4.42          7.          2.          1.       0.09

          HYDROGRAPH AT
+                         OFF110       24.    4.25          3.          1.          0.       0.04

          HYDROGRAPH AT
+                         OFF115        8.    4.08          1.          0.          0.       0.01

          ROUTED TO
```

+	HYDROGRAPH AT	ON220	3.	4.00	0.	0.	0.	0.00
+	2 COMBINED AT	CO220	11.	4.08	1.	0.	0.	0.01
+	ROUTED TO	RO215D	10.	4.17	1.	0.	0.	0.01
+	2 COMBINED AT	CO215A	32.	4.25	4.	1.	0.	0.05
+	ROUTED TO	RO215B	32.	4.25	4.	1.	0.	0.05
+	2 COMBINED AT	CO215B	74.	4.33	10.	3.	1.	0.13
+	ROUTED TO	RO215C	73.	4.33	10.	3.	1.	0.13
+	HYDROGRAPH AT	ON215	28.	4.17	2.	1.	0.	0.03
+	2 COMBINED AT	CO215C	93.	4.33	13.	3.	1.	0.16
+	ROUTED TO	RO240A	93.	4.33	13.	3.	1.	0.16
+	HYDROGRAPH AT	ON235	2.	4.08	0.	0.	0.	0.00
+	2 COMBINED AT	CO240A	93.	4.33	13.	3.	1.	0.16
+	ROUTED TO	RO240B	93.	4.33	13.	3.	1.	0.16
+	HYDROGRAPH AT	ON240	6.	4.17	1.	0.	0.	0.01
+	2 COMBINED AT	CO240B	97.	4.33	13.	3.	1.	0.17
+	ROUTED TO	RO260A	96.	4.33	13.	3.	1.	0.17
+	HYDROGRAPH AT	ON245	3.	4.08	0.	0.	0.	0.00
+	ROUTED TO	RO260B	3.	4.17	0.	0.	0.	0.00
+	HYDROGRAPH AT	ON260	2.	4.08	0.	0.	0.	0.00
+	3 COMBINED AT	CO260	99.	4.33	14.	3.	1.	0.17
+	HYDROGRAPH AT	ON265	2.	4.00	0.	0.	0.	0.00
+	HYDROGRAPH AT	ON270	5.	4.08	0.	0.	0.	0.00
+	ROUTED TO	DB270	2.	4.42	0.	0.	0.	0.00
+	HYDROGRAPH AT	ON280	2.	4.00	0.	0.	0.	0.00
+	HYDROGRAPH AT	OFF120	47.	4.33	7.	2.	1.	0.09
+	ROUTED TO							

+	HYDROGRAPH AT OFF125	52.	4.33	9.	2.	1.	0.11
+	ROUTED TO RO305B	52.	4.42	9.	2.	1.	0.11
+	2 COMBINED AT CO305A	98.	4.42	16.	4.	1.	0.20
+	ROUTED TO RO305C	97.	4.42	16.	4.	1.	0.20
+	HYDROGRAPH AT ON305	28.	4.08	2.	1.	0.	0.02
+	2 COMBINED AT CO305B	108.	4.42	18.	5.	2.	0.23
+	ROUTED TO RO230B	108.	4.42	18.	5.	2.	0.23
+	HYDROGRAPH AT ON225	7.	4.08	1.	0.	0.	0.00
+	ROUTED TO DB225	3.	4.25	1.	0.	0.	0.00
+	ROUTED TO RO230A	3.	4.42	1.	0.	0.	0.00
+	HYDROGRAPH AT ON230	7.	4.17	1.	0.	0.	0.01
+	3 COMBINED AT CO230	114.	4.42	20.	5.	2.	0.24
+	ROUTED TO RO250A	113.	4.42	20.	5.	2.	0.24
+	HYDROGRAPH AT ON320	1.	4.08	0.	0.	0.	0.00
+	ROUTED TO RO250B	1.	4.17	0.	0.	0.	0.00
+	HYDROGRAPH AT ON315	11.	4.08	1.	0.	0.	0.01
+	ROUTED TO RO250C	11.	4.17	1.	0.	0.	0.01
+	3 COMBINED AT CO250A	118.	4.42	21.	5.	2.	0.25
+	ROUTED TO RO250D	117.	4.42	21.	5.	2.	0.25
+	HYDROGRAPH AT ON250	9.	4.17	1.	0.	0.	0.01
+	2 COMBINED AT CO250B	121.	4.42	21.	5.	2.	0.26
+	ROUTED TO RO285A	119.	4.42	21.	5.	2.	0.26
+	HYDROGRAPH AT ON330	1.	4.08	0.	0.	0.	0.00
+	ROUTED TO RO255	1.	4.08	0.	0.	0.	0.00
+	HYDROGRAPH AT ON255	2.	4.08	0.	0.	0.	0.00
+	2 COMBINED AT CO255	4.	4.08	0.	0.	0.	0.00

+	RO285B	3.	4.08	0.	0.	0.	0.00
2 COMBINED AT							
+	CO285A	120.	4.42	22.	5.	2.	0.26
ROUTED TO							
+	RO285C	121.	4.50	22.	5.	2.	0.26
HYDROGRAPH AT							
+	ON285	12.	4.08	1.	0.	0.	0.01
2 COMBINED AT							
+	CO285B	123.	4.50	22.	6.	2.	0.27
HYDROGRAPH AT							
+	ON325	8.	4.08	1.	0.	0.	0.01
ROUTED TO							
+	DB325	2.	4.42	1.	0.	0.	0.01
ROUTED TO							
+	RO326	2.	4.50	1.	0.	0.	0.01
HYDROGRAPH AT							
+	ON326	7.	4.08	1.	0.	0.	0.01
2 COMBINED AT							
+	CO326	9.	4.17	1.	0.	0.	0.01
HYDROGRAPH AT							
+	ON360	1.	4.08	0.	0.	0.	0.00
5 COMBINED AT							
+	CEX1	130.	4.50	24.	6.	2.	0.29
HYDROGRAPH AT							
+	OFF130	17.	4.17	1.	0.	0.	0.02
HYDROGRAPH AT							
+	OFF135	23.	4.33	4.	1.	0.	0.06
2 COMBINED AT							
+	CO310A	34.	4.25	6.	1.	0.	0.08
ROUTED TO							
+	RO310A	34.	4.33	6.	1.	0.	0.08
HYDROGRAPH AT							
+	OFF145	4.	4.08	0.	0.	0.	0.00
ROUTED TO							
+	RO310B	4.	4.17	0.	0.	0.	0.00
2 COMBINED AT							
+	CO310B	37.	4.33	6.	2.	1.	0.08
ROUTED TO							
+	RO310C	37.	4.33	6.	2.	1.	0.08
HYDROGRAPH AT							
+	ON310	15.	4.17	2.	0.	0.	0.02
HYDROGRAPH AT							
+	ON311	16.	4.17	2.	0.	0.	0.01
ROUTED TO							
+	DB311	7.	4.50	1.	0.	0.	0.01
3 COMBINED AT							
+	CO310D	55.	4.33	9.	2.	1.	0.11
ROUTED TO							
+	RO312	55.	4.33	9.	2.	1.	0.11
HYDROGRAPH AT							
+	ON312	5.	4.08	0.	0.	0.	0.00
HYDROGRAPH AT							

	ROUTED TO						
+	DB313	1.	4.17	0.	0.	0.	0.00
	3 COMBINED AT						
+	CO312	58.	4.33	10.	3.	1.	0.12
	HYDROGRAPH AT						
+	ON355	2.	4.00	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	OFF140	24.	4.25	3.	1.	0.	0.04
	HYDROGRAPH AT						
+	OFF150	4.	4.17	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO335	26.	4.25	3.	1.	0.	0.04
	ROUTED TO						
+	RO335	26.	4.25	3.	1.	0.	0.04
	HYDROGRAPH AT						
+	ON335	2.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	ON336	11.	4.08	1.	0.	0.	0.01
	3 COMBINED AT						
+	CO336	33.	4.17	4.	1.	0.	0.05
	ROUTED TO						
+	DB336	23.	4.42	4.	1.	0.	0.05
	ROUTED TO						
+	RO337	23.	4.42	4.	1.	0.	0.05
	HYDROGRAPH AT						
+	ON337	9.	4.17	1.	0.	0.	0.01
	2 COMBINED AT						
+	CO337	28.	4.42	5.	1.	0.	0.06
	HYDROGRAPH AT						
+	OFF155	3.	4.17	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	OFF160	16.	4.33	3.	1.	0.	0.04
	2 COMBINED AT						
+	CO340A	19.	4.33	3.	1.	0.	0.04
	ROUTED TO						
+	RO340	19.	4.33	3.	1.	0.	0.04
	HYDROGRAPH AT						
+	ON340	14.	4.08	1.	0.	0.	0.01
	ROUTED TO						
+	DB340	4.	4.50	1.	0.	0.	0.01
	2 COMBINED AT						
+	CO340B	22.	4.33	4.	1.	0.	0.05
	HYDROGRAPH AT						
+	OFF165	4.	4.08	0.	0.	0.	0.00
	ROUTED TO						
+	RO345	4.	4.08	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	ON345	1.	4.17	0.	0.	0.	0.00
	2 COMBINED AT						
+	CO345	5.	4.08	0.	0.	0.	0.00
	HYDROGRAPH AT						
+	ON350	1.	4.00	0.	0.	0.	0.00

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   19FEB17  TIME  18:16:10   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  1           ID       Flood Control District of Maricopa County
  2           ID       STORYROCK PH3 PROP - STORYROCK PHASE 3 PROP CONDITION
  3           ID       100 YEAR
  4           ID       6 Hour  Storm
  5           ID       Unit Hydrograph: Clark
  6           ID       Storm: Multiple
  7           ID       02/19/2017
              *DIAGRAM
  8           IT      5  1JAN99      0    2000
  9           IO      5
 10           IN     15
              *
 11           JD  3.174  0.0001
 12           PC  0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
 13           PC  0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
 14           PC  0.962   0.972   0.983   0.991   1.000
 15           JD  3.155  0.5000
 16           PC  0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
 17           PC  0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
 18           PC  0.962   0.972   0.983   0.991   1.000
 19           JD  3.095     2.8
 20           PC  0.000   0.009   0.016   0.025   0.034   0.042   0.051   0.059   0.067   0.076
 21           PC  0.087   0.100   0.120   0.163   0.252   0.451   0.694   0.837   0.900   0.938
 22           PC  0.950   0.963   0.975   0.988   1.000
              *

 23           KK  OFF105   BASIN
 24           BA  0.085
 25           LG   0.35    0.40    6.00    0.18       0
 26           UC  0.336   0.402
 27           UA      0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 28           UA    100
              *

 29           KK  RO215A   ROUTE
 30           RS       1    FLOW
 31           RC  0.050   0.035   0.050     975  0.0360    0.00
 32           RX   0.00    9.00   21.00   25.00   32.00   36.00   70.00   90.00
 33           RY   2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
              *
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34          KK  OFF110   BASIN
35          BA   0.037
36          LG    0.35    0.40    6.00    0.18       0
37          UC   0.268   0.353
38          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
39          UA     100
            *

40          KK  OFF115   BASIN
41          BA   0.007
42          LG    0.35    0.40    6.00    0.18       0
43          UC   0.142   0.140
44          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
45          UA     100
            *
```



```
LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

46          KK   RO220   ROUTE
47          RS       1    FLOW
48          RC   0.050   0.035   0.050     310  0.0420    0.00
49          RX    0.00    8.00   15.00   21.00   21.10   25.00   30.00   36.00
50          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

51          KK   ON220   BASIN
52          BA   0.002
53          LG    0.30    0.25    6.00    0.17      17
54          UC   0.092   0.155
55          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
56          UA     100
            *

57          KK   CO220 COMBINE
58          HC       2
            *

59          KK  RO215D   ROUTE
60          RS       1    FLOW
61          RC   0.050   0.035   0.050     364  0.0300    0.00
62          RX    0.00    5.00    8.00   11.00   11.10   14.00   17.00   24.00
63          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *

64          KK  CO215A COMBINE
65          HC       2
            *

66          KK  RO215B   ROUTE
67          RS       1    FLOW
68          RC   0.050   0.035   0.050     800  0.0340    0.00
69          RX    0.00    6.00   10.00   13.00   19.00   21.00   26.00   62.00
70          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

71          KK  CO215B COMBINE
72          HC       2
            *

73          KK  RO215C   ROUTE
74          RS       1    FLOW
75          RC   0.050   0.035   0.050     445  0.0340    0.00
76          RX    0.00   12.00   28.00   36.00   48.00   71.00   73.00   76.00
77          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
            *

78          KK   ON215   BASIN
79          BA   0.030
80          LG    0.35    0.40    6.00    0.18       0
81          UC   0.218   0.202
82          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
83          UA     100
            *
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LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
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```
 84          KK  CO215C COMBINE
 85          HC       2
             *

 86          KK  RO240A   ROUTE
 87          RS       1    FLOW
 88          RC   0.050   0.035   0.050     245  0.0370    0.00
 89          RX    0.00    5.00   10.00   14.00   32.00   41.00   48.00   52.00
 90          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

 91          KK   ON235   BASIN
 92          BA   0.002
 93          LG    0.35    0.40    6.00    0.18       0
 94          UC   0.110   0.132
 95          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 96          UA     100
             *

 97          KK  CO240A COMBINE
 98          HC       2
             *

 99          KK  RO240B   ROUTE
100          RS       1    FLOW
101          RC   0.050   0.035   0.050     465  0.0390    0.00
102          RX    0.00    7.00   19.00   49.00   65.00   70.00   77.00   85.00
103          RY    2.00    0.50    1.00    0.00    0.00    1.00    0.00    2.00
             *

104          KK   ON240   BASIN
105          BA   0.007
106          LG    0.35    0.40    6.00    0.18       0
107          UC   0.172   0.225
108          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
109          UA     100
             *

110          KK  CO240B COMBINE
111          HC       2
             *

112          KK  RO260A   ROUTE
113          RS       1    FLOW
114          RC   0.050   0.035   0.050     225  0.0360    0.00
115          RX    0.00    7.00   15.00   26.00   29.00   34.00   42.00   50.00
116          RY    2.00    1.00    0.00    0.00    1.00    1.00    0.50    1.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

117          KK   ON245   BASIN
118          BA   0.003
119          LG    0.35    0.40    6.00    0.18       0
120          UC   0.143   0.216
121          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
122          UA     100
             *

123          KK  RO260B   ROUTE
124          RS       1    FLOW
125          RC   0.050   0.035   0.050     361  0.0280    0.00
126          RX    0.00   23.00   44.00   69.00   70.00   85.00   92.00  104.00
127          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

128          KK   ON260   BASIN
129          BA   0.002
130          LG    0.35    0.40    6.00    0.18       0
131          UC   0.135   0.202
132          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
133          UA     100
             *

134          KK  CO260 COMBINE
```

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                *
     136        KK   ON265   BASIN
     137        BA   0.001
     138        LG    0.30    0.25    6.00    0.22      27
     139        UC   0.069   0.103
     140        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     141        UA     100
                *

     142        KK   ON270   BASIN
     143        BA   0.004
     144        LG    0.30    0.25    6.00    0.22      27
     145        UC   0.114   0.179
     146        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     147        UA     100
                *

     148        KK   DB270 STORAGE
     149        KO
     150        RS       1    STOR
     151        SV            0.04    0.08    0.12    0.16    0.20    0.24    0.24
     152        SQ                    1.00    1.00    2.00    2.00    3.00    7.00
     153        SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
                *
1                                        HEC-1 INPUT                                    PAGE  5

   LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

     154        KK   ON280   BASIN
     155        BA   0.001
     156        LG    0.30    0.25    6.00    0.22      27
     157        UC   0.065   0.070
     158        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     159        UA     100
                *

     160        KK  OFF120   BASIN
     161        BA   0.095
     162        LG    0.35    0.40    6.00    0.18       0
     163        UC   0.354   0.489
     164        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     165        UA     100
                *

     166        KK  RO305A   ROUTE
     167        RS       1    FLOW
     168        RC   0.050   0.035   0.050     685  0.0480    0.00
     169        RX    0.00   10.00   21.00   30.00   43.00   61.00   68.00   75.00
     170        RY    3.00    2.00    1.00    0.00    0.00    1.00    0.00    1.00
                *

     171        KK  OFF125   BASIN
     172        BA   0.109
     173        LG    0.35    0.40    6.00    0.18       2
     174        UC   0.374   0.528
     175        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     176        UA     100
                *

     177        KK  RO305B   ROUTE
     178        RS       1    FLOW
     179        RC   0.050   0.035   0.050     970  0.0480    0.00
     180        RX    0.00    6.00    8.00   20.00   32.00   43.00   51.00   66.00
     181        RY    3.00    2.00    1.00    0.00    0.00    1.00    1.50    2.00
                *

     182        KK  CO305A COMBINE
     183        HC       2
                *

     184        KK  RO305C   ROUTE
     185        RS       1    FLOW
     186        RC   0.050   0.035   0.050     653  0.0430    0.00
     187        RX    0.00   10.00   15.00   26.00   43.00  155.00  165.00  169.00
     188        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                *
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 189          KK   ON305   BASIN
 190          BA   0.023
 191          LG    0.30    0.29    6.00    0.18      15
 192          UC   0.168   0.181
 193          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 194          UA     100
              *

 195          KK  CO305B COMBINE
 196          HC       2
              *

 197          KK  RO230B   ROUTE
 198          RS       1    FLOW
 199          RC   0.050   0.035   0.050     270  0.0480    0.00
 200          RX    0.00    9.00   30.00   45.00  118.00  122.00  127.00  132.00
 201          RY    2.00    1.00    0.50    0.00    0.00    1.00    2.00    3.00
              *

 202          KK   ON225   BASIN
 203          BA   0.005
 204          LG    0.30    0.25    6.00    0.19      19
 205          UC   0.106   0.130
 206          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 207          UA     100
              *

 208          KK   DB225 STORAGE
 209          KO
 210          RS       1    STOR
 211          SV            0.07    0.15    0.22    0.32    0.42    0.53
 212          SQ            1.00    3.00    4.00    5.00    5.00    6.00
 213          SE            0.50    1.00    1.50    2.00    2.50    3.00
              *

 214          KK  RO230A   ROUTE
 215          RS       1    FLOW
 216          RC   0.050   0.035   0.050     770  0.0340    0.00
 217          RX    0.00   10.00   20.00   35.00   51.00   61.00   68.00   73.00
 218          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
              *

 219          KK   ON230   BASIN
 220          BA   0.007
 221          LG    0.35    0.40    6.00    0.18       0
 222          UC   0.173   0.206
 223          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 224          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 225          KK   CO230 COMBINE
 226          HC       3
              *

 227          KK  RO250A   ROUTE
 228          RS       1    FLOW
 229          RC   0.050   0.035   0.050     433  0.0420    0.00
 230          RX    0.00    8.00   17.00   25.00   47.00   51.00   58.00   62.00
 231          RY    2.00    1.00    0.50    0.00    0.00    0.50    0.75    1.00
              *

 232          KK   ON320   BASIN
 233          BA   0.001
 234          LG    0.35    0.40    6.00    0.18       0
 235          UC   0.110   0.149
 236          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 237          UA     100
              *

 238          KK  RO250B   ROUTE
```

```
 240        RC   0.050   0.035   0.050     650  0.0400    0.00
 241        RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
 242        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *

 243        KK   ON315   BASIN
 244        BA   0.009
 245        LG    0.31    0.28    6.00    0.17      13
 246        UC   0.140   0.182
 247        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 248        UA     100
            *

 249        KK  RO250C   ROUTE
 250        RS       1    FLOW
 251        RC   0.050   0.035   0.050     402  0.0350    0.00
 252        RX    0.00   26.00   31.00   38.00   39.00   44.00   58.00   68.00
 253        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *

 254        KK  CO250A COMBINE
 255        HC       3
            *

 256        KK  RO250D   ROUTE
 257        RS       1    FLOW
 258        RC   0.050   0.035   0.050     271  0.0410    0.00
 259        RX    0.00   34.00   60.00   71.00   81.00  110.00  121.00  134.00
 260        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *
```



```
LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 261        KK   ON250   BASIN
 262        BA   0.009
 263        LG    0.35    0.40    6.00    0.18       0
 264        UC   0.173   0.196
 265        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 266        UA     100
            *

 267        KK  CO250B COMBINE
 268        HC       2
            *

 269        KK  RO285A   ROUTE
 270        RS       1    FLOW
 271        RC   0.050   0.035   0.050     378  0.0420    0.00
 272        RX    0.00   34.00   64.00   88.00  110.00  115.00  118.00  120.00
 273        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *

 274        KK   ON330   BASIN
 275        BA   0.001
 276        LG    0.35    0.40    6.00    0.18       0
 277        UC   0.103   0.161
 278        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 279        UA     100
            *

 280        KK   RO255   ROUTE
 281        RS       1    FLOW
 282        RC   0.050   0.035   0.050     213  0.0470    0.00
 283        RX    0.00    6.00   11.00   18.00   18.10   27.00   35.00   40.00
 284        RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
            *

 285        KK   ON255   BASIN
 286        BA   0.002
 287        LG    0.35    0.40    6.00    0.18       0
 288        UC   0.110   0.131
 289        UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 290        UA     100
            *
```

```
                  *

     293          KK  RO285B   ROUTE
     294          RS       1    FLOW
     295          RC   0.050   0.035   0.050     543  0.0370    0.00
     296          RX    0.00   12.00   12.00   14.00   14.10   19.00   24.00   28.00
     297          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                  *
1                                      HEC-1 INPUT                                                 PAGE  9

    LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


     298          KK  CO285A COMBINE
     299          HC       2
                  *

     300          KK  RO285C   ROUTE
     301          RS       1    FLOW
     302          RC   0.050   0.035   0.050     315  0.0410    0.00
     303          RX    0.00    8.00   15.00   22.00  149.00  169.00  178.00  182.00
     304          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                  *

     305          KK   ON285   BASIN
     306          BA   0.009
     307          LG    0.32    0.31    6.00    0.17      11
     308          UC   0.136   0.150
     309          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     310          UA     100
                  *

     311          KK  CO285B COMBINE
     312          HC       2
                  *

     313          KK   ON325   BASIN
     314          BA   0.006
     315          LG    0.31    0.28    6.00    0.17      14
     316          UC   0.123   0.170
     317          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     318          UA     100
                  *

     319          KK   DB325 STORAGE
     320          KO
     321          RS       1    STOR
     322          SV            0.05    0.10    0.15    0.20    0.25    0.30    0.30
     323          SQ                    1.00    2.00    2.00    3.00    3.00   11.00
     324          SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
                  *

     325          KK   RO326   ROUTE
     326          RS       1    FLOW
     327          RC   0.050   0.035   0.050     963  0.0370    0.00
     328          RX    0.00   10.00   13.00   16.00   16.50   19.00   20.00   22.00
     329          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
                  *

     330          KK   ON326   BASIN
     331          BA   0.007
     332          LG    0.31    0.29    6.00    0.17      12
     333          UC   0.158   0.232
     334          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
     335          UA     100
                  *
1                                      HEC-1 INPUT                                                 PAGE 10

    LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


     336          KK   CO326 COMBINE
     337          HC       2
                  *

     338          KK   ON360   BASIN
     339          BA   0.001
```

```
342          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
343          UA     100
             *

344          KK    CEX1 COMBINE
345          HC       5
             *

346          KK  OFF130   BASIN
347          BA   0.018
348          LG    0.35    0.40    6.00    0.18       0
349          UC   0.191   0.204
350          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
351          UA     100
             *

352          KK  OFF135   BASIN
353          BA   0.057
354          LG    0.35    0.40    6.00    0.18       0
355          UC   0.361   0.630
356          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
357          UA     100
             *

358          KK  CO310A COMBINE
359          HC       2
             *

360          KK  RO310A   ROUTE
361          RS       1    FLOW
362          RC   0.050   0.035   0.050    1060  0.0420    0.00
363          RX    0.00    8.00   20.00   32.00   36.00   42.00   46.00   50.00
364          RY    3.00    2.00    1.00    0.00    0.00    1.00    2.00    3.00
             *

365          KK  OFF145   BASIN
366          BA   0.004
367          LG    0.35    0.40    6.00    0.18       0
368          UC   0.144   0.196
369          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
370          UA     100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

371          KK  RO310B   ROUTE
372          RS       1    FLOW
373          RC   0.050   0.035   0.050     850  0.0470    0.00
374          RX    0.00    6.00    8.00   10.00   12.00   14.00   15.00   19.00
375          RY    4.00    3.00    2.00    0.00    0.00    2.00    3.00    4.00
             *

376          KK  CO310B COMBINE
377          HC       2
             *

378          KK  RO310C   ROUTE
379          RS       1    FLOW
380          RC   0.050   0.035   0.050    1000  0.0450    0.00
381          RX    0.00    4.00    8.00   16.00   20.00   22.00   24.00   26.00
382          RY    3.00    2.50    2.00    0.00    0.00    2.00    3.00    4.00
             *

383          KK   ON310   BASIN
384          BA   0.018
385          LG    0.31    0.28    6.00    0.18      15
386          UC   0.202   0.343
387          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
388          UA     100
             *

389          KK   ON311   BASIN
390          BA   0.015
391          LG    0.30    0.26    6.00    0.19      17
392          UC   0.164   0.240
393          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
```

```
                *
395             KK   DB311 STORAGE
396             KO
397             RS      1    STOR
398             SV           0.12   0.21   0.32   0.45   0.60   0.74   0.74
399             SQ                  2.00   5.00   7.00   9.00  11.00  23.00
400             SE           0.50   1.00   1.50   2.00   2.50   3.00   3.01
                *

401             KK   CO310D COMBINE
402             HC      3
                *

403             KK   RO312   ROUTE
404             RS      1    FLOW
405             RC   0.050   0.035  0.050    675  0.0410   0.00
406             RX    0.00    4.00   6.00  10.00   12.00  24.00  74.00  83.00
407             RY    4.00    3.00   2.00   0.00    0.00   2.00   3.00   4.00
                *
1                                    HEC-1 INPUT                          PAGE 12

LINE            ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

408             KK   ON312   BASIN
409             BA   0.004
410             LG    0.32    0.31   6.00   0.17     10
411             UC   0.123   0.175
412             UA       0     3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
413             UA     100
                *

414             KK   ON313   BASIN
415             BA   0.004
416             LG    0.29    0.36   6.00   0.20     15
417             UC   0.155   0.239
418             UA       0     3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
419             UA     100
                *

420             KK   DB313 STORAGE
421             KO
422             RS      1    STOR
423             SV           0.04   0.08   0.12   0.18   0.23   0.30
424             SQ                  1.00   1.00   1.00   2.00   2.00
425             SE           0.50   1.00   1.50   2.00   2.50   3.00
                *

426             KK   CO312 COMBINE
427             HC      3
                *

428             KK   ON355   BASIN
429             BA   0.001
430             LG    0.30    0.25   6.00   0.17     17
431             UC   0.066   0.085
432             UA       0     3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
433             UA     100
                *

434             KK  OFF140   BASIN
435             BA   0.035
436             LG    0.35    0.40   6.00   0.18      0
437             UC   0.264   0.338
438             UA       0     3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
439             UA     100
                *

440             KK  OFF150   BASIN
441             BA   0.004
442             LG    0.35    0.40   6.00   0.18      0
443             UC   0.153   0.222
444             UA       0     3.0    5.0    8.0   12.0   20.0   43.0   75.0   90.0   96.0
445             UA     100
                *
1                                    HEC-1 INPUT                          PAGE 13
```

```
446          KK   CO335 COMBINE
447          HC      2
             *

448          KK   RO335   ROUTE
449          RS      1    FLOW
450          RC  0.050  0.035  0.050    688  0.0420    0.00
451          RX   0.00   2.00   4.00   6.00   6.10   10.00   12.00   15.00
452          RY   3.00   2.00   1.00   0.00   0.00    1.00    2.00    3.00
             *

453          KK   ON335   BASIN
454          BA  0.002
455          LG   0.33   0.33   6.00   0.17      9
456          UC  0.143  0.357
457          UA      0    3.0    5.0    8.0   12.0    20.0    43.0    75.0    90.0    96.0
458          UA    100
             *

459          KK   ON336   BASIN
460          BA  0.007
461          LG   0.31   0.27   6.00   0.19     16
462          UC  0.107  0.096
463          UA      0    3.0    5.0    8.0   12.0    20.0    43.0    75.0    90.0    96.0
464          UA    100
             *

465          KK   CO336 COMBINE
466          HC      3
             *

467          KK   DB336 STORAGE
468          KO
469          RS      1    STOR
470          SV           0.16   0.32   0.49   0.68   0.67    1.08    1.08
471          SQ           6.00  10.00  18.00  28.00  35.00   45.00   66.00
472          SE           0.50   1.00   1.50   2.00   2.50    2.95    3.00
             *

473          KK   RO337   ROUTE
474          RS      1    FLOW
475          RC  0.050  0.035  0.050    467  0.0470    0.00
476          RX   0.00  10.00  12.00  18.00  18.10   22.00   26.00   50.00
477          RY   5.00   3.00   3.00   0.00   0.00    3.00    4.00    5.00
             *

478          KK   ON337   BASIN
479          BA  0.009
480          LG   0.31   0.27   6.00   0.18     17
481          UC  0.176  0.286
482          UA      0    3.0    5.0    8.0   12.0    20.0    43.0    75.0    90.0    96.0
483          UA    100
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

484          KK   CO337 COMBINE
485          HC      2
             *

486          KK  OFF155   BASIN
487          BA  0.004
488          LG   0.35   0.40   6.00   0.18      0
489          UC  0.161  0.262
490          UA      0    3.0    5.0    8.0   12.0    20.0    43.0    75.0    90.0    96.0
491          UA    100
             *

492          KK  OFF160   BASIN
493          BA  0.035
494          LG   0.35   0.40   6.00   0.18      0
495          UC  0.314  0.543
496          UA      0    3.0    5.0    8.0   12.0    20.0    43.0    75.0    90.0    96.0
```

```
 498          KK  CO340A COMBINE
 499          HC       2
              *

 500          KK   RO340   ROUTE
 501          RS       1    FLOW
 502          RC   0.050   0.035   0.050     820  0.0420    0.00
 503          RX    0.00   10.00   12.00   18.00   18.10   22.00   26.00   50.00
 504          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
              *

 505          KK   ON340   BASIN
 506          BA   0.011
 507          LG    0.31    0.28    6.00    0.17      14
 508          UC   0.143   0.185
 509          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 510          UA     100
              *

 511          KK   DB340 STORAGE
 512          KO
 513          RS       1    STOR
 514          SV            0.10    0.20    0.31    0.43    0.55    0.70    0.70
 515          SQ            1.00    2.00    3.00    4.00    5.00    6.00   11.00
 516          SE            0.50    1.00    1.50    2.00    2.50    2.95    3.00
              *

 517          KK  CO340B COMBINE
 518          HC       2
              *
1                                          HEC-1 INPUT                                                PAGE 15

 LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 519          KK  OFF165   BASIN
 520          BA   0.003
 521          LG    0.35    0.40    6.00    0.18       0
 522          UC   0.114   0.120
 523          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 524          UA     100
              *

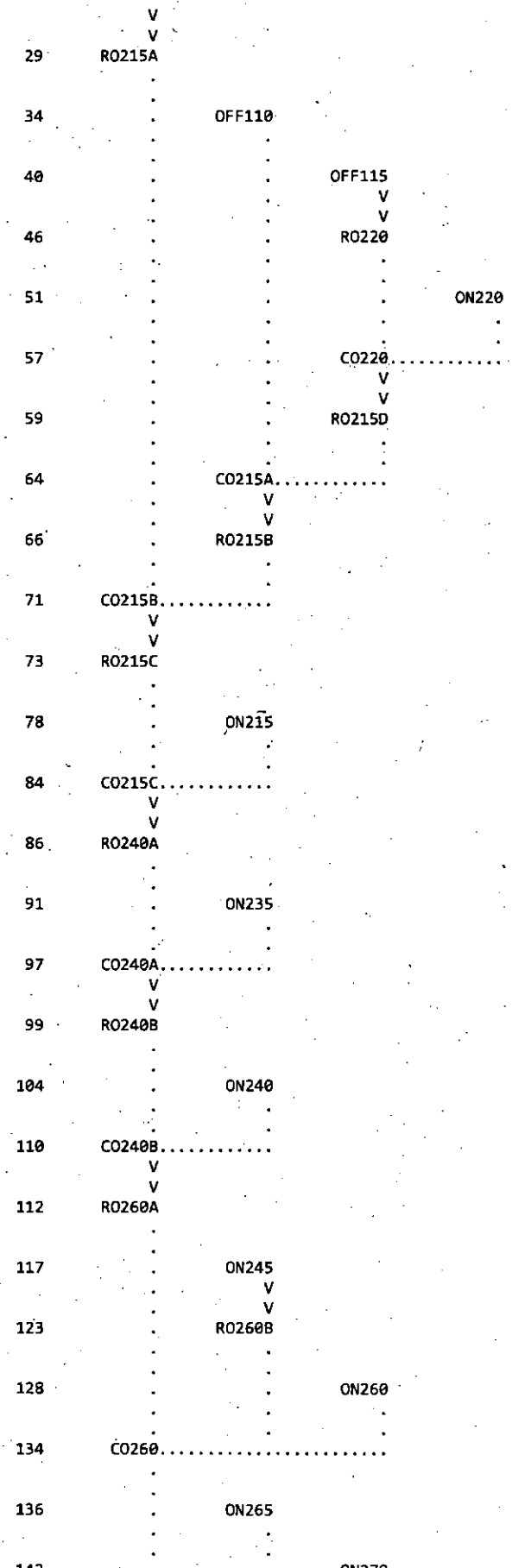
 525          KK   RO345   ROUTE
 526          RS       1    FLOW
 527          RC   0.050   0.035   0.050     490  0.0490    0.00
 528          RX    0.00    6.00   10.00   12.00   12.10   15.00   17.00   21.00
 529          RY    5.00    3.00    3.00    0.00    0.00    3.00    4.00    5.00
              *

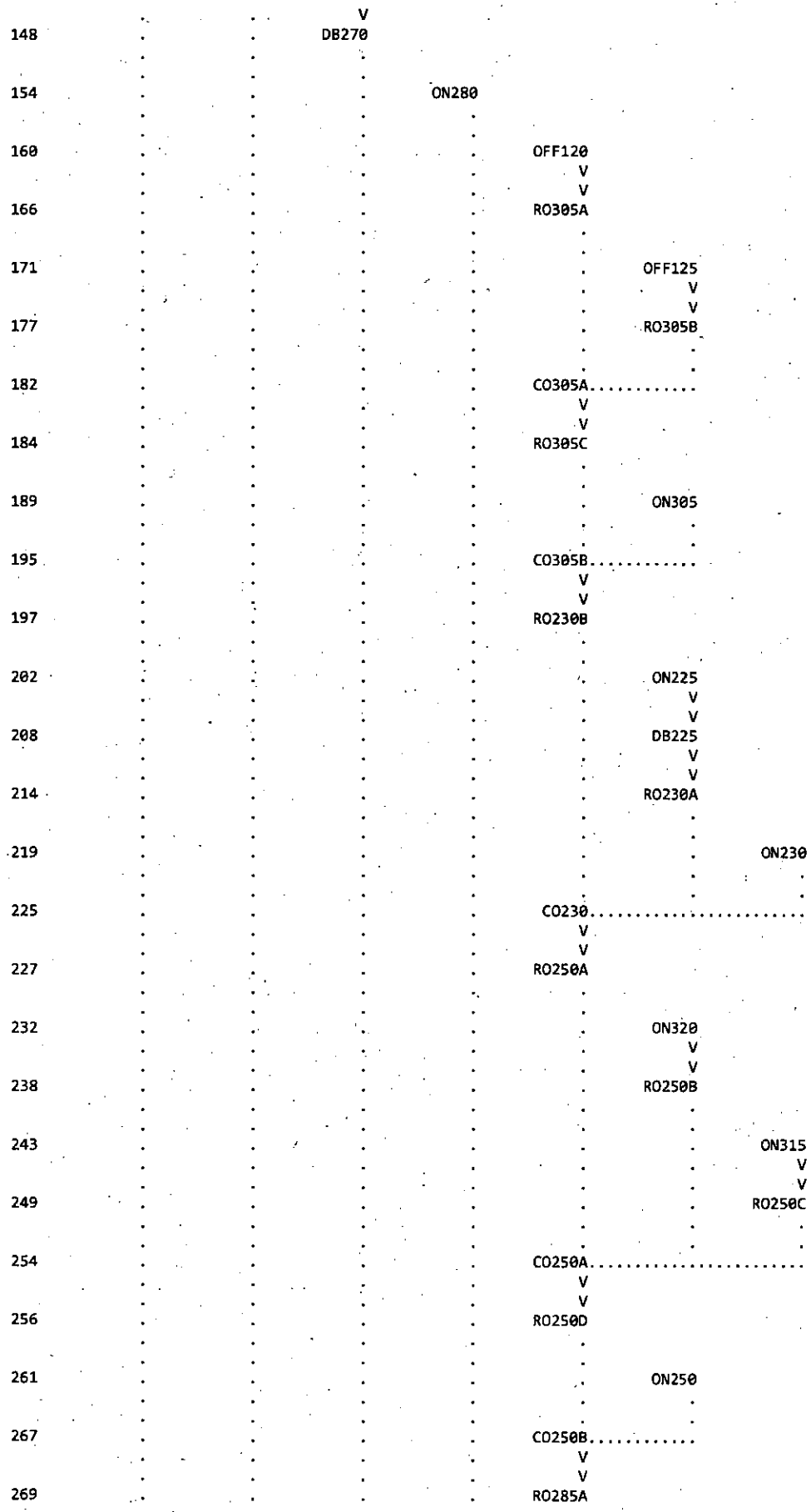
 530          KK   ON345   BASIN
 531          BA   0.002
 532          LG    0.35    0.40    6.00    0.18       0
 533          UC   0.156   0.337
 534          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 535          UA     100
              *

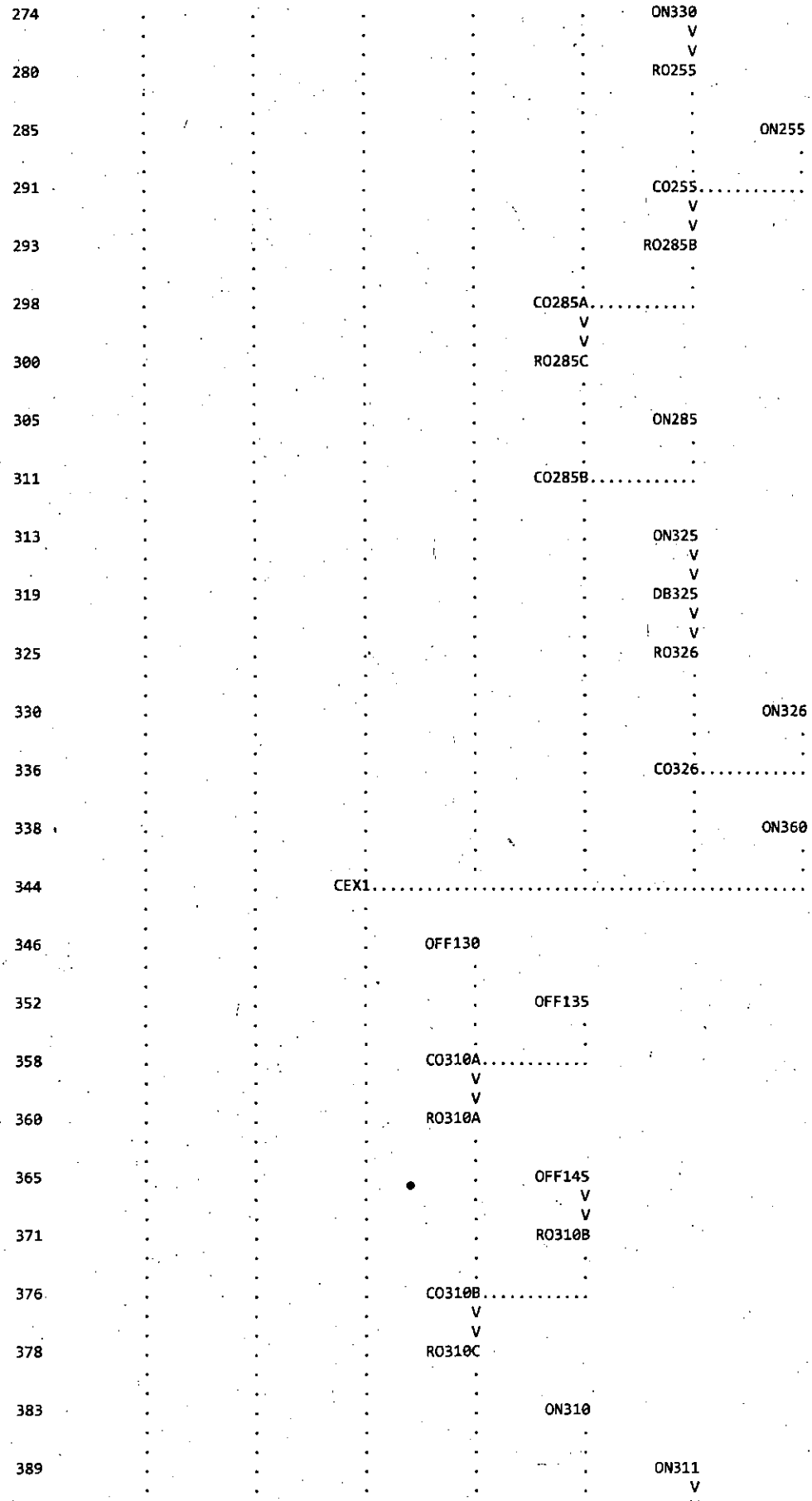
 536          KK   CO345 COMBINE
 537          HC       2
              *

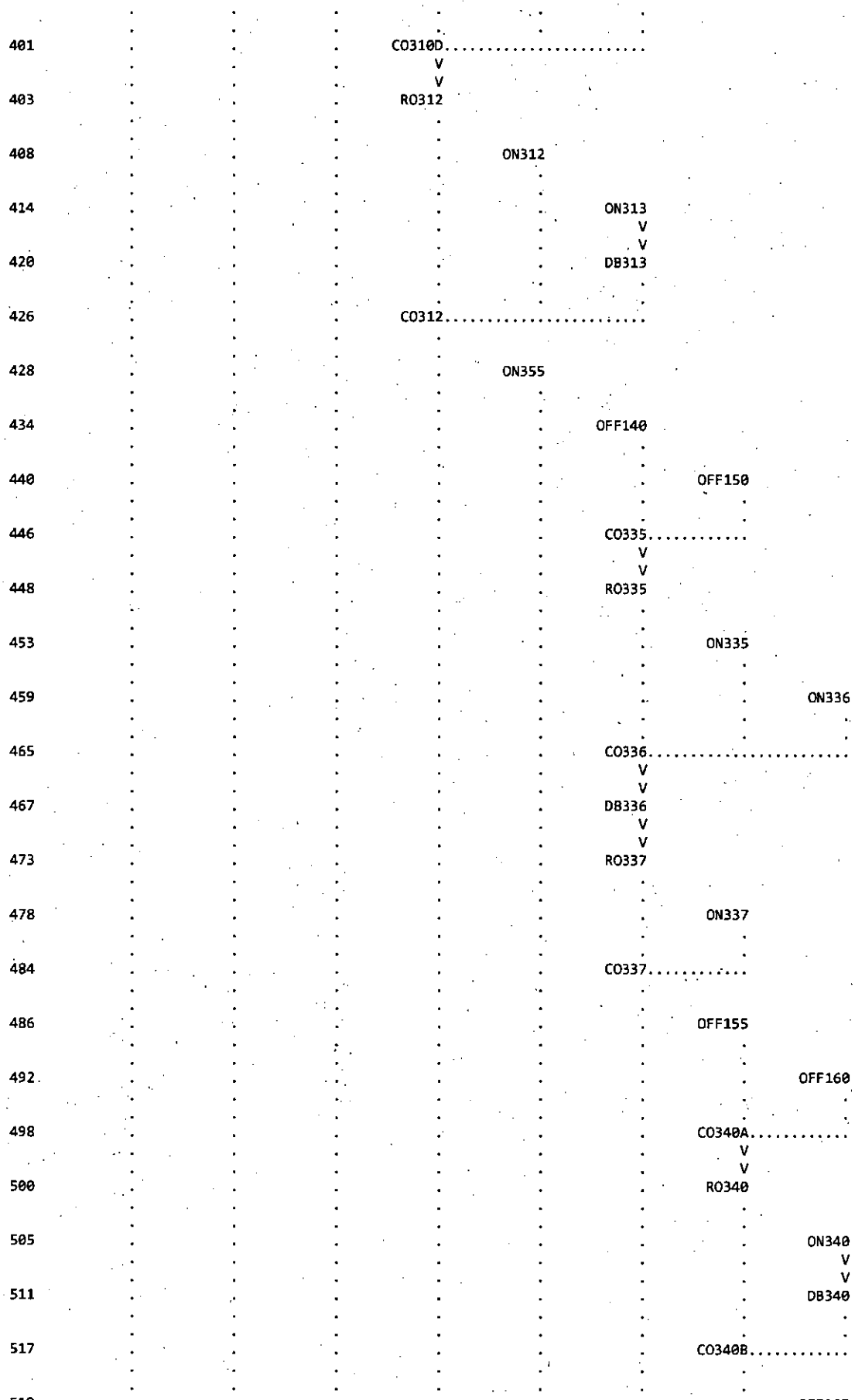
 538          KK   ON350   BASIN
 539          BA   0.001
 540          LG    0.33    0.33    6.00    0.17       9
 541          UC   0.085   0.130
 542          UA       0     3.0     5.0     8.0    12.0    20.0    43.0    75.0    90.0    96.0
 543          UA     100
              *
 544          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

 NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW
```


29 RO215A
34 OFF110
40 OFF115
46 RO220
51 ON220
57 CO220
59 RO215D
64 CO215A
66 RO215B
71 CO215B
73 RO215C
78 ON215
84 CO215C
86 RO240A
91 ON235
97 CO240A
99 RO240B
104 ON240
110 CO240B
112 RO260A
117 ON245
123 RO260B
128 ON260
134 CO260
136 ON265


V
148 DB270
154 ON280
160 OFF120
V
V
166 RO305A
171 OFF125
V
V
177 RO305B
182 CO305A
V
V
184 RO305C
189 ON305
195 CO305B
V
V
197 RO230B
202 ON225
V
V
208 DB225
V
V
214 RO230A
219 ON230
225 CO230
V
V
227 RO250A
232 ON320
V
V
238 RO250B
243 ON315
V
V
249 RO250C
254 CO250A
V
V
256 RO250D
261 ON250
267 CO250B
V
V
269 RO285A


274
ON330
280
RO255
285
ON255
291
CO255
293
RO285B
298
CO285A
300
RO285C
305
ON285
311
CO285B
313
ON325
319
DB325
325
RO326
330
ON326
336
CO326
338
ON360
344
CEX1
346
OFF130
352
OFF135
358
CO310A
360
RO310A
365
OFF145
371
RO310B
376
CO310B
378
RO310C
383
ON310
389
ON311


401
CO310D
V
V
403
RO312
408
ON312
414
ON313
V
V
420
DB313
426
CO312
428
ON355
434
OFF140
440
OFF150
446
CO335
V
V
448
RO335
453
ON335
459
ON336
465
CO336
V
V
467
DB336
V
V
473
RO337
478
ON337
484
CO337
486
OFF155
492
OFF160
498
CO340A
V
V
500
RO340
505
ON340
V
V
511
DB340
517
CO340B

```
                                                                                    V
 525        .       .       .       .       .       .       .       .       RO345
            .       .       .       .       .       .       .       .         .
 530        .       .       .       .       .       .       .       .         .         ON345
            .       .       .       .       .       .       .       .         .           .
 536        .       .       .       .       .       .       .       .       CO345............
            .       .       .       .       .       .       .       .         .
 538        .       .       .       .       .       .       .       .         .         ON350
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1***************************************                          ***************************************
*                                      *                          *                                     *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                          *   U.S. ARMY CORPS OF ENGINEERS      *
*              JUN   1998              *                          *   HYDROLOGIC ENGINEERING CENTER     *
*            VERSION 4.1               *                          *        609 SECOND STREET            *
*                                      *                          *     DAVIS, CALIFORNIA 95616         *
* RUN DATE   19FEB17  TIME  18:16:10   *                          *         (916) 756-1104              *
*                                      *                          *                                     *
***************************************                           ***************************************
```

```
                              Flood Control District of Maricopa County
                              STORYROCK PH3 PROP - STORYROCK PHASE 3 PROP CONDITION
                              100 YEAR
                              6 Hour  Storm
                              Unit Hydrograph: Clark
                              Storm: Multiple
                              02/19/2017

   9 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE     1JAN99  STARTING DATE
                       ITIME       0000  STARTING TIME
                          NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE     7JAN99  ENDING DATE
                      NDTIME       2235  ENDING TIME
                       ICENT         19  CENTURY MARK

                   COMPUTATION INTERVAL    0.08 HOURS
                        TOTAL TIME BASE  166.58 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA          SQUARE MILES
                 PRECIPITATION DEPTH    INCHES
                 LENGTH, ELEVATION      FEET
                 FLOW                   CUBIC FEET PER SECOND
                 STORAGE VOLUME         ACRE-FEET
                 SURFACE AREA           ACRES
                 TEMPERATURE            DEGREES FAHRENHEIT

  11 JD          INDEX STORM NO. 1
                        STRM       3.17  PRECIPITATION DEPTH
                        TRDA       0.00  TRANSPOSITION DRAINAGE AREA

  12 PI            PRECIPITATION PATTERN
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                     0.03      0.03      0.05      0.05      0.05      0.15      0.15      0.15      0.03      0.03
                     0.03      0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00

  15 JD          INDEX STORM NO. 2
                        STRM       3.15  PRECIPITATION DEPTH
```

```
 16 PI            PRECIPITATION PATTERN
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                     0.03      0.03      0.05      0.05      0.05      0.15      0.15      0.15      0.03      0.03
                     0.03      0.01      0.01      0.01      0.01      0.01      0.01      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00

 19 JD           INDEX STORM NO. 3
                      STRM        3.10  PRECIPITATION DEPTH
                      TRDA        2.80  TRANSPOSITION DRAINAGE AREA

 20 PI            PRECIPITATION PATTERN
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00      0.00      0.01      0.01      0.01      0.01      0.01      0.01      0.03
                     0.03      0.03      0.07      0.07      0.07      0.08      0.08      0.08      0.05      0.05
                     0.05      0.02      0.02      0.02      0.01      0.01      0.01      0.00      0.00      0.00
                     0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
                     0.00      0.00

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
148 KK     *     DB270  *      STORAGE
           *            *
           **************

149 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
208 KK     *     DB225  *      STORAGE
           *            *
           **************

209 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
319 KK     *     DB325  *      STORAGE
           *            *
           **************

320 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
```

```
395 KK      *     DB311  *      STORAGE
            *            *
            **************

396 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
420 KK      *     DB313  *      STORAGE
            *            *
            **************

421 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
467 KK      *     DB336  *      STORAGE
            *            *
            **************

468 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
511 KK      *     DB340  *      STORAGE
            *            *
            **************

512 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
1
                                    RUNOFF SUMMARY
                              FLOW IN CUBIC FEET PER SECOND
                            TIME IN HOURS,  AREA IN SQUARE MILES

                                        PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN    MAXIMUM     TIME OF
          OPERATION       STATION       FLOW     PEAK                                          AREA     STAGE     MAX STAGE
+                                                          6-HOUR     24-HOUR     72-HOUR

          HYDROGRAPH AT
+                         OFF105         122.    4.25         14.         4.          1.      0.09

          ROUTED TO
+                         RO215A         116.    4.25         14.         4.          1.      0.09

          HYDROGRAPH AT
+                         OFF110          58.    4.17          6.         2.          1.      0.04

          HYDROGRAPH AT
+                         OFF115          17.    4.08          1.         0.          0.      0.01

          ROUTED TO
```

+	HYDROGRAPH AT ON220	5.	4.00	0.	0.	0.	0.00
+	2 COMBINED AT CO220	22.	4.08	2.	0.	0.	0.01
+	ROUTED TO RO215D	22.	4.08	2.	0.	0.	0.01
+	2 COMBINED AT CO215A	77.	4.17	8.	2.	1.	0.05
+	ROUTED TO RO215B	75.	4.17	8.	2.	1.	0.05
+	2 COMBINED AT CO215B	188.	4.25	22.	5.	2.	0.13
+	ROUTED TO RO215C	187.	4.25	22.	5.	2.	0.13
+	HYDROGRAPH AT ON215	64.	4.08	5.	1.	0.	0.03
+	2 COMBINED AT CO215C	230.	4.25	27.	7.	2.	0.16
+	ROUTED TO RO240A	231.	4.25	27.	7.	2.	0.16
+	HYDROGRAPH AT ON235	5.	4.00	0.	0.	0.	0.00
+	2 COMBINED AT CO240A	233.	4.25	27.	7.	2.	0.16
+	ROUTED TO RO240B	233.	4.25	27.	7.	2.	0.16
+	HYDROGRAPH AT ON240	15.	4.08	1.	0.	0.	0.01
+	2 COMBINED AT CO240B	243.	4.25	28.	7.	2.	0.17
+	ROUTED TO RO260A	241.	4.25	28.	7.	2.	0.17
+	HYDROGRAPH AT ON245	6.	4.08	1.	0.	0.	0.00
+	ROUTED TO RO260B	6.	4.08	1.	0.	0.	0.00
+	HYDROGRAPH AT ON260	4.	4.08	0.	0.	0.	0.00
+	3 COMBINED AT CO260	248.	4.25	29.	7.	2.	0.17
+	HYDROGRAPH AT ON265	3.	4.00	0.	0.	0.	0.00
+	HYDROGRAPH AT ON270	10.	4.00	1.	0.	0.	0.00
+	ROUTED TO DB270	7.	4.17	1.	0.	0.	0.00
+	HYDROGRAPH AT ON280	3.	4.00	0.	0.	0.	0.00
+	HYDROGRAPH AT OFF120	121.	4.25	16.	4.	1.	0.09
+	ROUTED TO						

	HYDROGRAPH AT						
+		OFF125	132.	4.25	19.	5.	2.	0.11
	ROUTED TO						
+		RO305B	129.	4.33	19.	5.	2.	0.11
	2 COMBINED AT						
+		CO305A	247.	4.25	34.	9.	3.	0.20
	ROUTED TO						
+		RO305C	247.	4.33	34.	9.	3.	0.20
	HYDROGRAPH AT						
+		ON305	57.	4.08	5.	1.	0.	0.02
	2 COMBINED AT						
+		CO305B	270.	4.33	39.	10.	3.	0.23
	ROUTED TO						
+		RO230B	271.	4.33	39.	10.	3.	0.23
	HYDROGRAPH AT						
+		ON225	14.	4.00	1.	0.	0.	0.00
	ROUTED TO						
+		DB225	5.	4.25	1.	0.	0.	0.00
	ROUTED TO						
+		RO230A	5.	4.42	1.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON230	15.	4.08	1.	0.	0.	0.01
	3 COMBINED AT						
+		CO230	283.	4.33	41.	10.	3.	0.24
	ROUTED TO						
+		RO250A	285.	4.33	41.	10.	3.	0.24
	HYDROGRAPH AT						
+		ON320	2.	4.00	0.	0.	0.	0.00
	ROUTED TO						
+		RO250B	2.	4.08	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON315	22.	4.08	2.	0.	0.	0.01
	ROUTED TO						
+		RO250C	22.	4.08	2.	0.	0.	0.01
	3 COMBINED AT						
+		CO250A	295.	4.33	43.	11.	4.	0.25
	ROUTED TO						
+		RO250D	296.	4.33	43.	11.	4.	0.25
	HYDROGRAPH AT						
+		ON250	20.	4.08	2.	0.	0.	0.01
	2 COMBINED AT						
+		CO250B	304.	4.33	45.	11.	4.	0.26
	ROUTED TO						
+		RO285A	306.	4.33	45.	11.	4.	0.26
	HYDROGRAPH AT						
+		ON330	2.	4.00	0.	0.	0.	0.00
	ROUTED TO						
+		RO255	2.	4.00	0.	0.	0.	0.00
	HYDROGRAPH AT						
+		ON255	5.	4.00	0.	0.	0.	0.00
	2 COMBINED AT						
+		CO255	8.	4.00	1.	0.	0.	0.00

+	RO285B	7.	4.08	1.	0.	0.	0.00
	2 COMBINED AT						
+	CO285A	308.	4.33	45.	11.	4.	0.26
	ROUTED TO						
+	RO285C	309.	4.33	45.	11.	4.	0.26
	HYDROGRAPH AT						
+	ON285	23.	4.08	2.	0.	0.	0.01
	2 COMBINED AT						
+	CO285B	316.	4.33	47.	12.	4.	0.27
	HYDROGRAPH AT						
+	ON325	15.	4.00	1.	0.	0.	0.01
	ROUTED TO						
+	DB325	11.	4.17	1.	0.	0.	0.01
	ROUTED TO						
+	RO326	9.	4.25	1.	0.	0.	0.01
	HYDROGRAPH AT						
+	ON326	15.	4.08	1.	0.	0.	0.01
	2 COMBINED AT						
+	CO326	20.	4.17	2.	0.	0.	0.01
	HYDROGRAPH AT						
+	ON360	2.	4.00	0.	0.	0.	0.00
	5 COMBINED AT						
+	CEX1	334.	4.33	50.	13.	4.	0.29
	HYDROGRAPH AT						
+	OFF130	39.	4.08	3.	1.	0.	0.02
	HYDROGRAPH AT						
+	OFF135	61.	4.25	9.	2.	1.	0.06
	2 COMBINED AT						
+	CO310A	90.	4.17	12.	3.	1.	0.08
	ROUTED TO						
+	RO310A	88.	4.25	12.	3.	1.	0.08
	HYDROGRAPH AT						
+	OFF145	9.	4.08	1.	0.	0.	0.00
	ROUTED TO						
+	RO310B	8.	4.08	1.	0.	0.	0.00
	2 COMBINED AT						
+	CO310B	94.	4.17	13.	3.	1.	0.08
	ROUTED TO						
+	RO310C	95.	4.25	13.	3.	1.	0.08
	HYDROGRAPH AT						
+	ON310	32.	4.17	4.	1.	0.	0.02
	HYDROGRAPH AT						
+	ON311	33.	4.08	3.	1.	0.	0.01
	ROUTED TO						
+	DB311	23.	4.25	3.	1.	0.	0.01
	3 COMBINED AT						
+	CO310D	144.	4.25	20.	5.	2.	0.11
	ROUTED TO						
+	RO312	142.	4.25	20.	5.	2.	0.11
	HYDROGRAPH AT						
+	ON312	9.	4.00	1.	0.	0.	0.00

	ROUTED TO							
+		DB313	2.	4.33	1.	0.	0.	0.00
	3 COMBINED AT							
+		CO312	149.	4.25	21.	5.	2.	0.12
	HYDROGRAPH AT							
+		ON355	3.	4.00	0.	0.	0.	0.00
	HYDROGRAPH AT							
+		OFF140	57.	4.17	6.	1.	0.	0.04
	HYDROGRAPH AT							
+		OFF150	8.	4.08	1.	0.	0.	0.00
	2 COMBINED AT							
+		CO335	64.	4.17	7.	2.	1.	0.04
	ROUTED TO							
+		RO335	64.	4.17	7.	2.	1.	0.04
	HYDROGRAPH AT							
+		ON335	3.	4.08	0.	0.	0.	0.00
	HYDROGRAPH AT							
+		ON336	21.	4.00	1.	0.	0.	0.01
	3 COMBINED AT							
+		CO336	76.	4.17	8.	2.	1.	0.05
	ROUTED TO							
+		DB336	66.	4.25	8.	2.	1.	0.05
	ROUTED TO							
+		RO337	61.	4.25	8.	2.	1.	0.05
	HYDROGRAPH AT							
+		ON337	18.	4.08	2.	0.	0.	0.01
	2 COMBINED AT							
+		CO337	75.	4.25	10.	3.	1.	0.06
	HYDROGRAPH AT							
+		OFF155	8.	4.08	1.	0.	0.	0.00
	HYDROGRAPH AT							
+		OFF160	42.	4.25	6.	1.	0.	0.04
	2 COMBINED AT							
+		CO340A	47.	4.17	6.	2.	1.	0.04
	ROUTED TO							
+		RO340	48.	4.25	6.	2.	1.	0.04
	HYDROGRAPH AT							
+		ON340	27.	4.08	2.	1.	0.	0.01
	ROUTED TO							
+		DB340	11.	4.33	2.	1.	0.	0.01
	2 COMBINED AT							
+		CO340B	54.	4.33	9.	2.	1.	0.05
	HYDROGRAPH AT							
+		OFF165	8.	4.00	1.	0.	0.	0.00
	ROUTED TO							
+		RO345	8.	4.00	1.	0.	0.	0.00
	HYDROGRAPH AT							
+		ON345	3.	4.08	0.	0.	0.	0.00
	2 COMBINED AT							
+		CO345	11.	4.08	1.	0.	0.	0.00
	HYDROGRAPH AT							

*** NORMAL END OF HEC-1 ***

Appendix C – Hydraulics

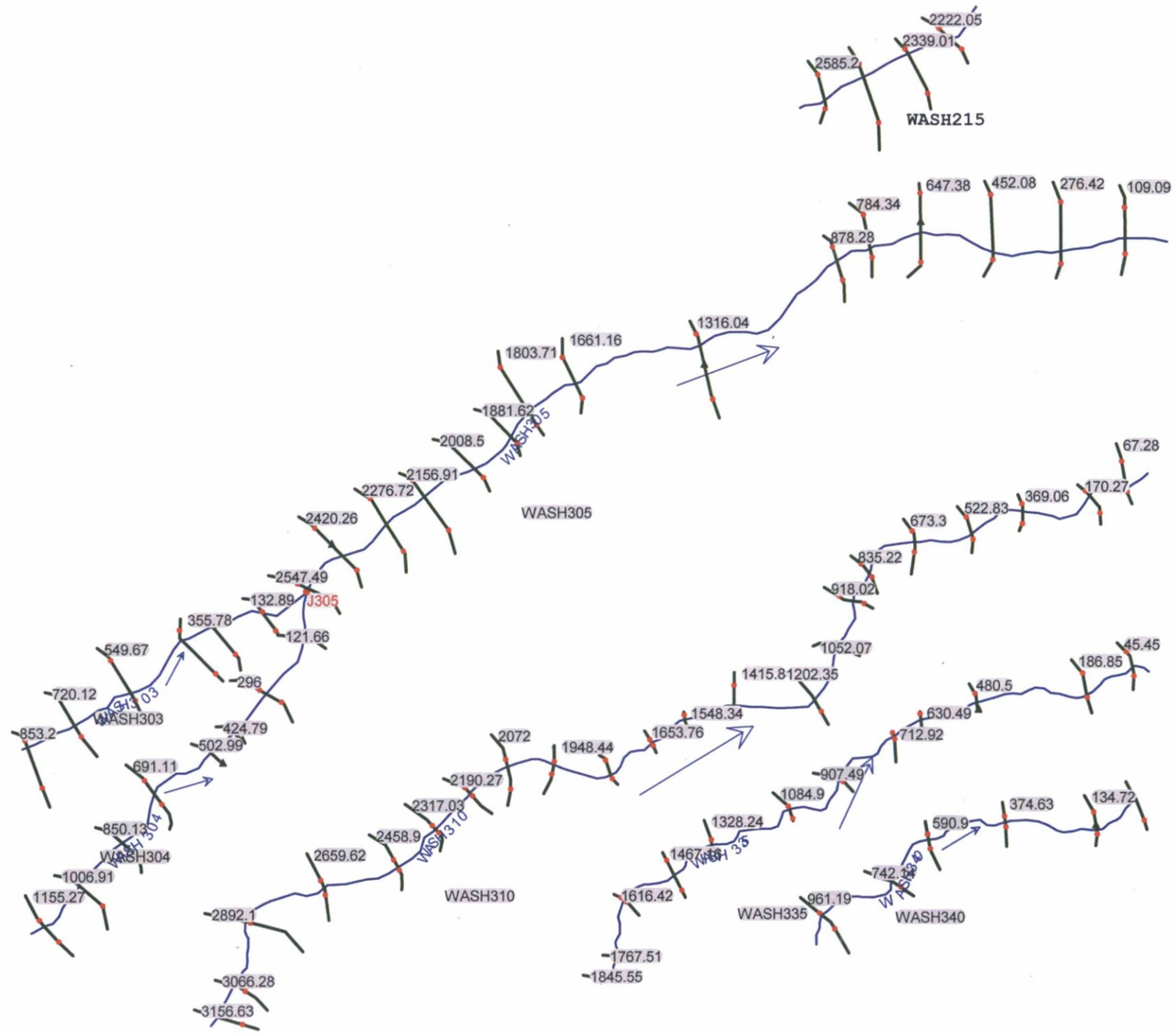
HEC-RAS Output (Existing and Proposed Conditions)

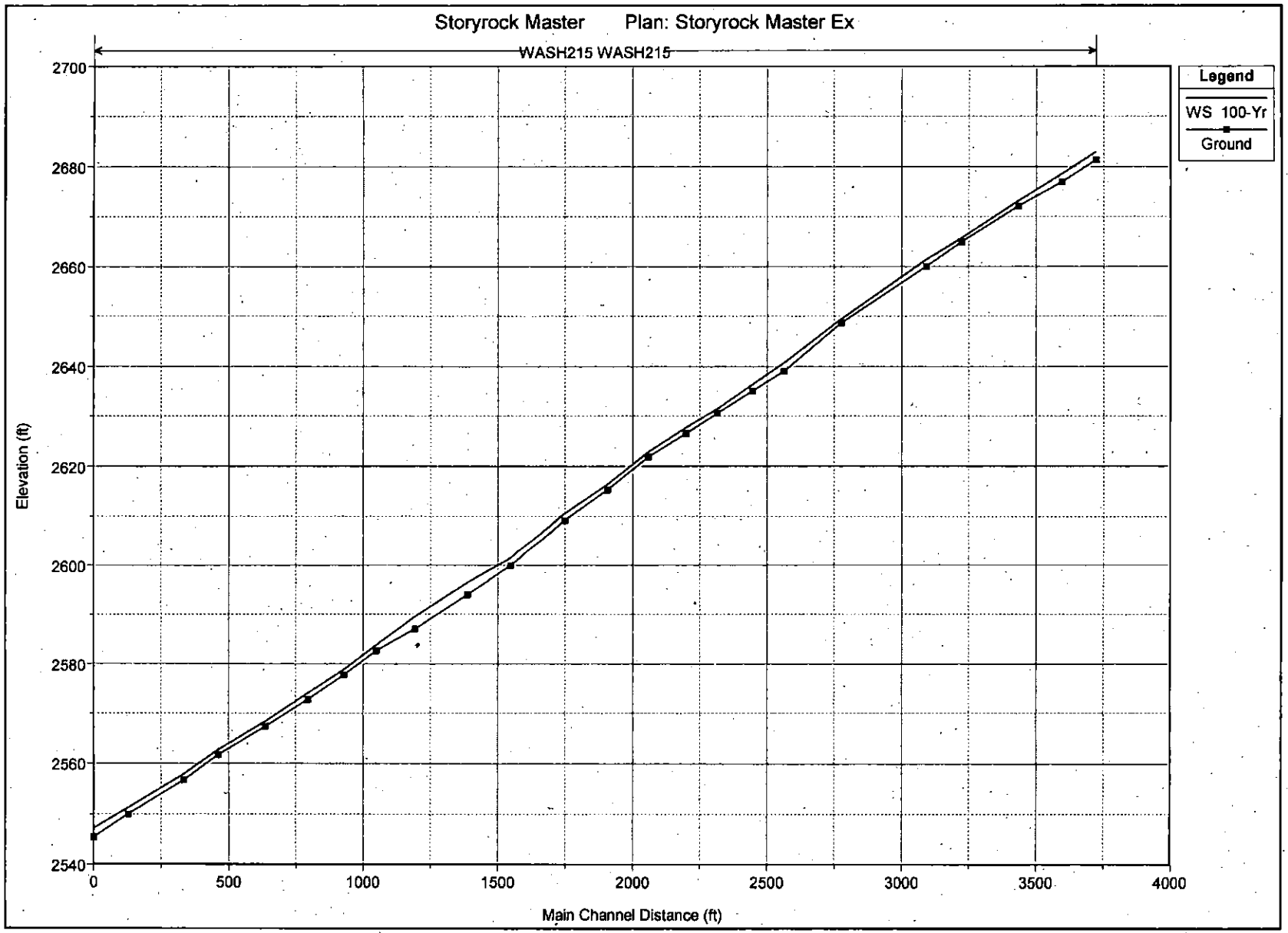
- Schematic Geometry
- Cross Sections
- Profiles
- Summary Table

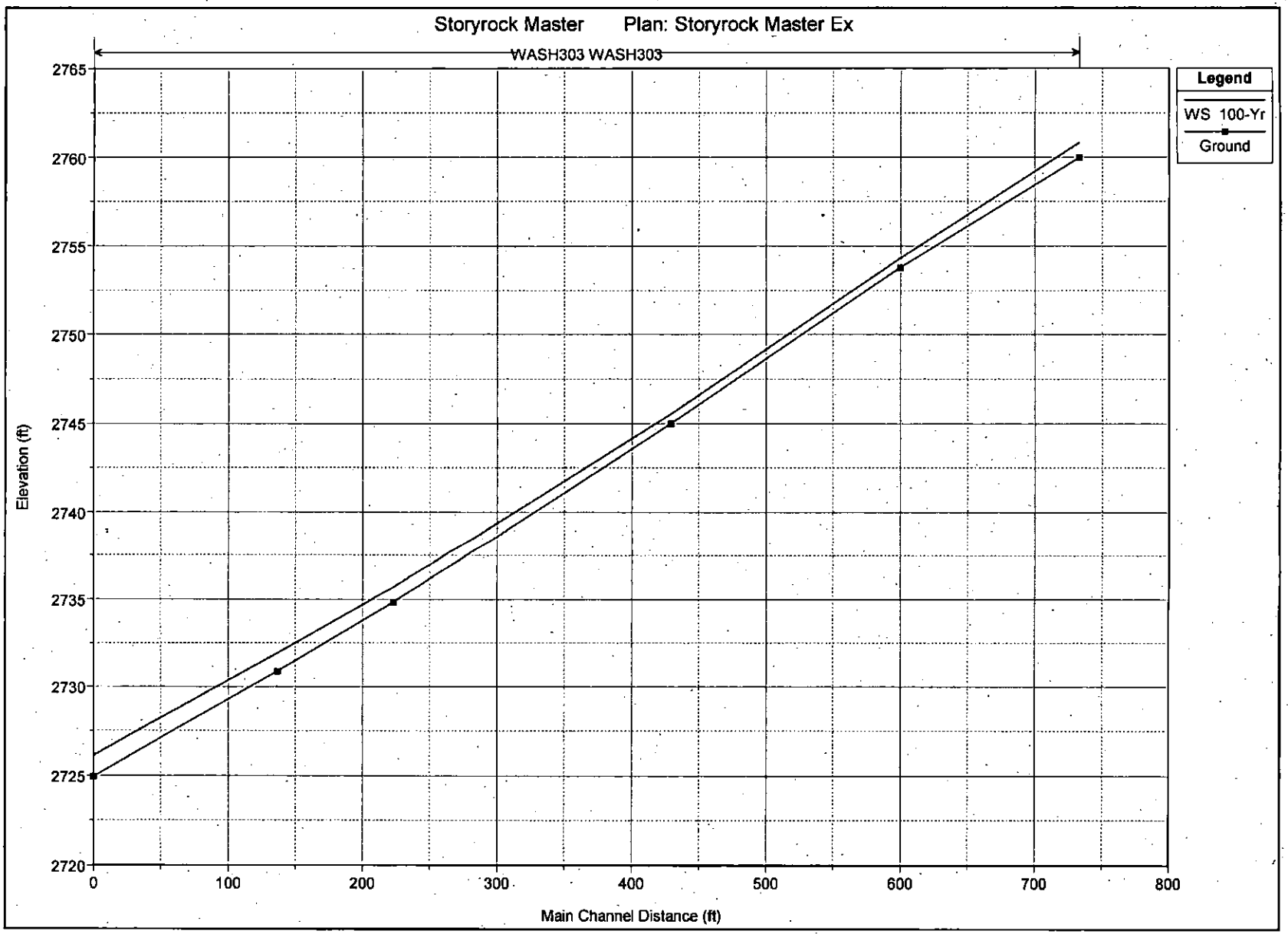
HY-8 Output:

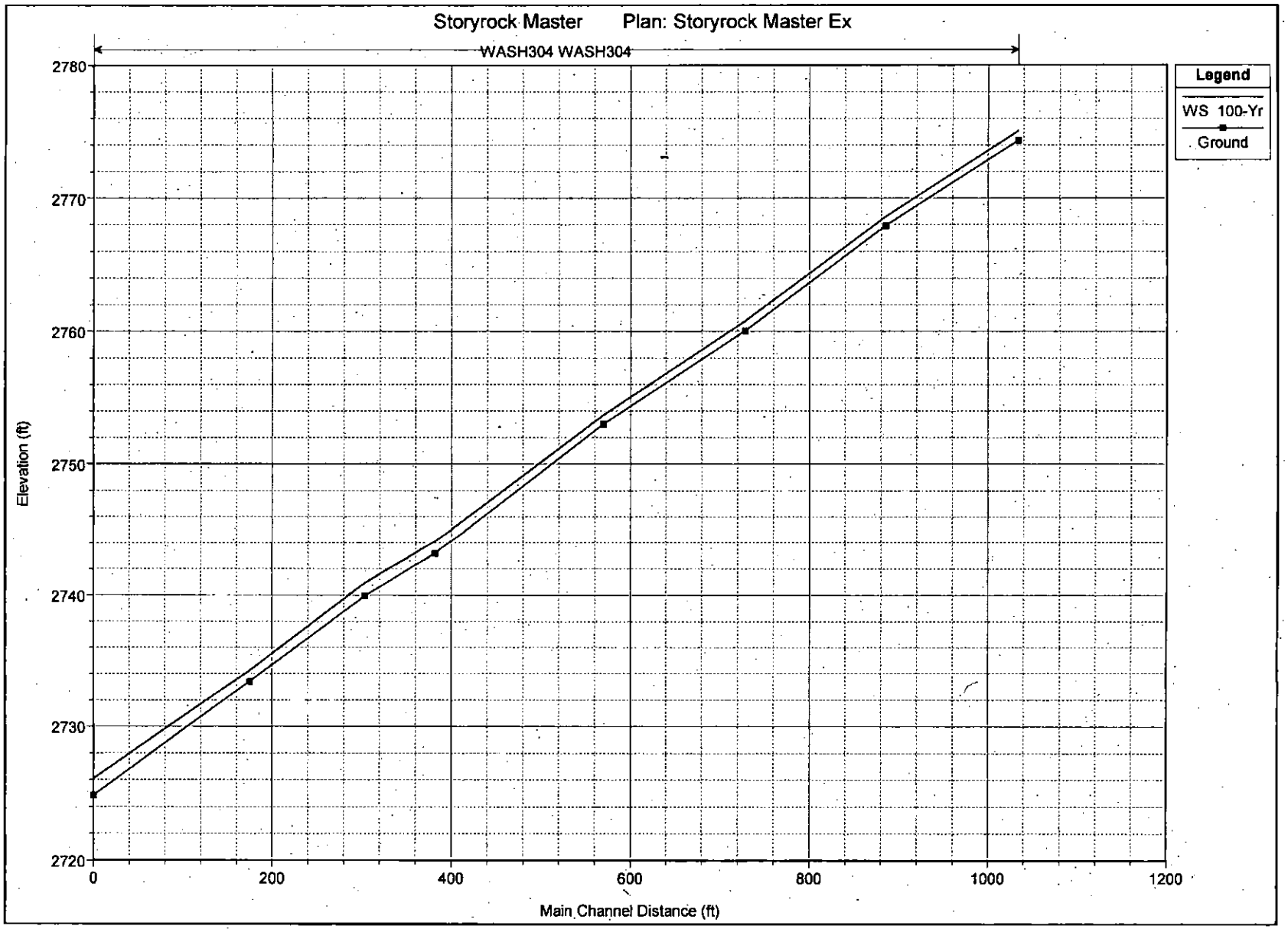
- Preliminary Culvert Calculations

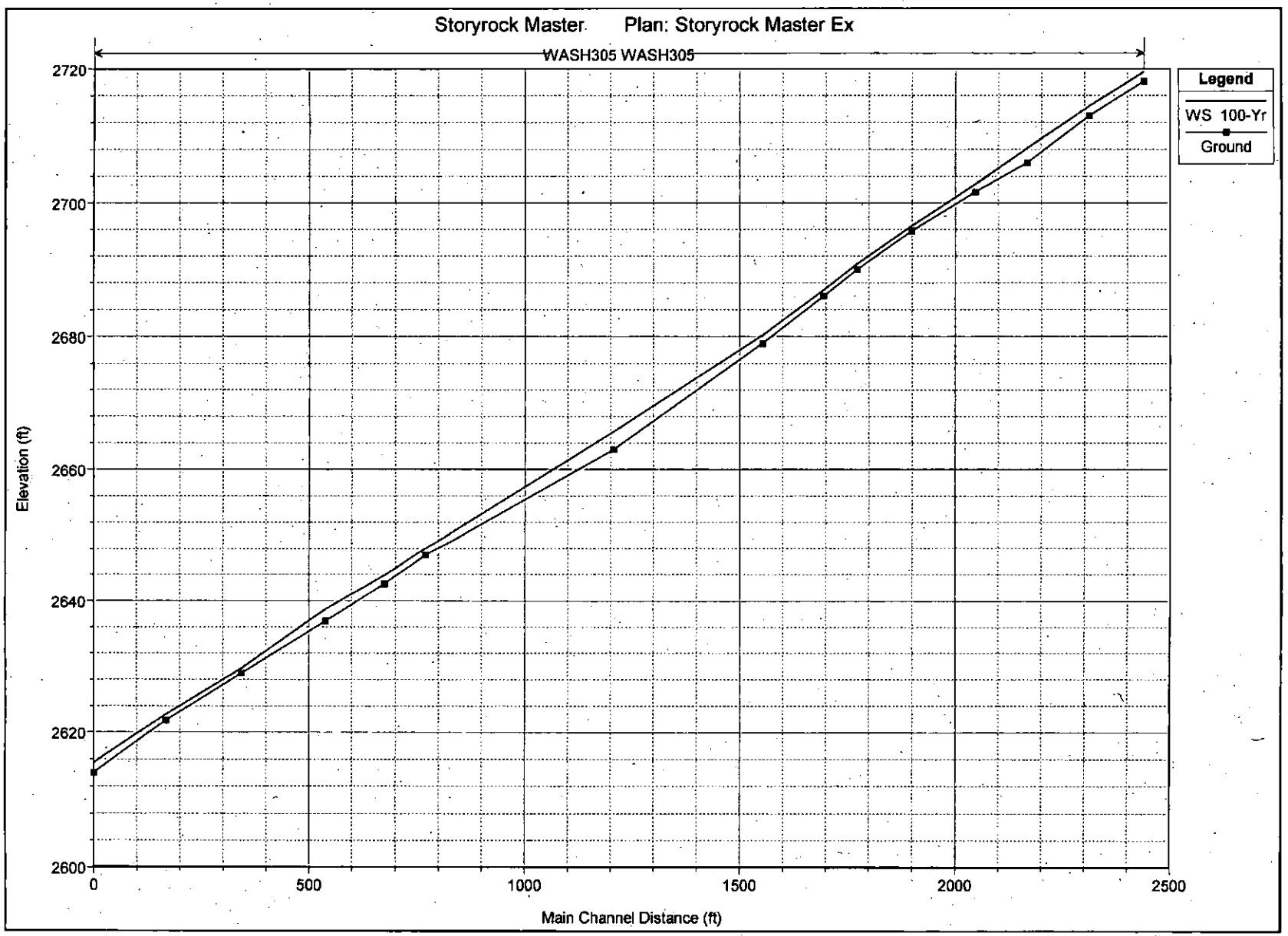
First Flush Spillway/Dissipation Basin Design:

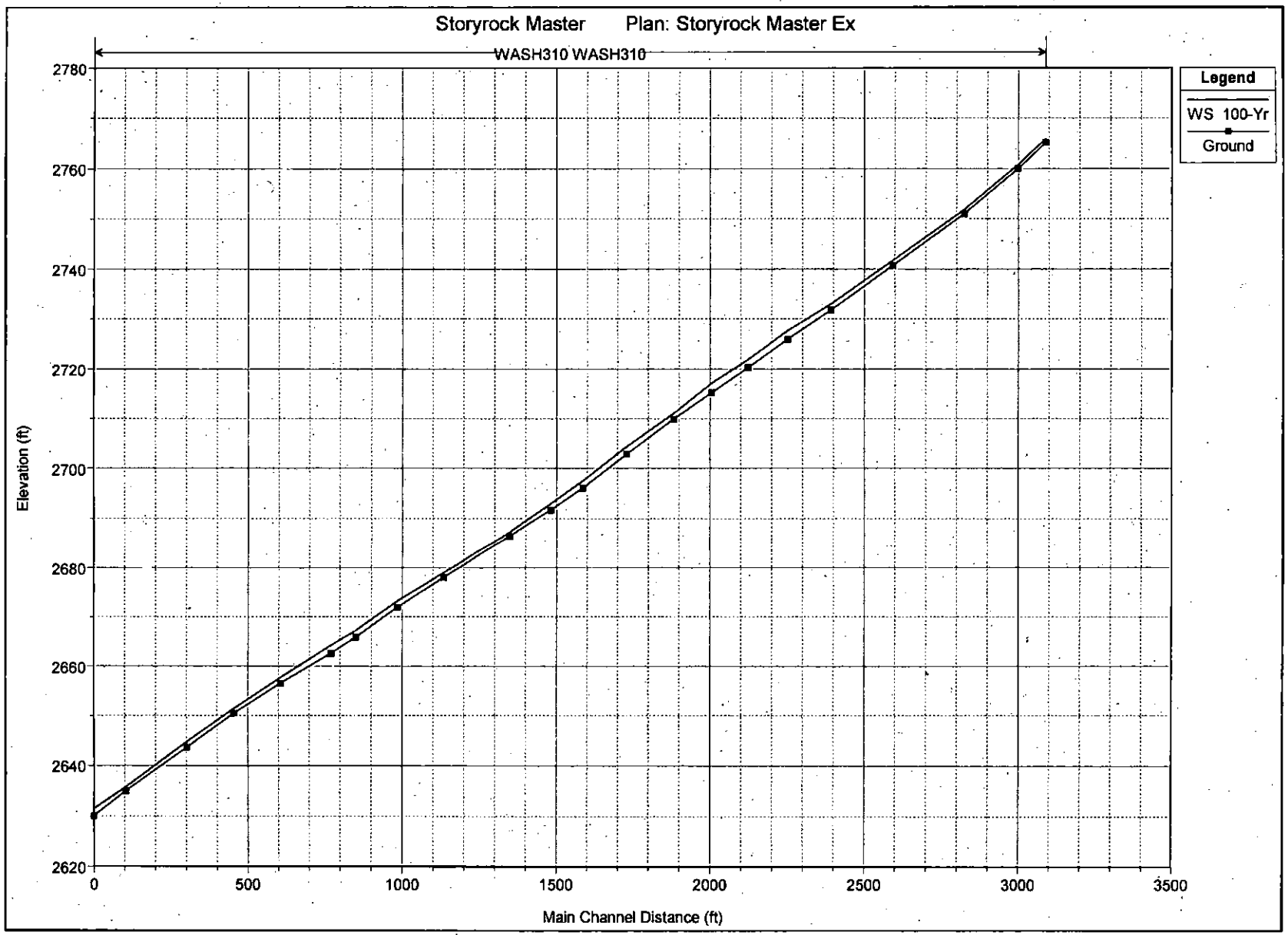

2222.05
2339.01
2585.2
WASH215
647.38
452.08
276.42
109.09
784.34
878.28
1316.04
1803.71
1661.16
1881.62
2008.5
2156.91
2276.72
2420.26
2547.49
132.89
J305
355.78
121.66
549.67
296
720.12
WASH303
853.2
424.79
502.99
691.11
850.13
WASH304
1006.91
1155.27
WASH305
67.28
170.27
369.06
522.83
673.3
835.22
918.02
1052.07
1415.81
202.35
1548.34
1653.76
1948.44
2072
2190.27
2317.03
2458.9
2659.62
2892.1
3066.28
3156.63
WASH310
45.45
186.85
480.5
630.49
712.92
907.49
1084.9
1328.24
1616.42
1767.51
1845.55
WASH335
961.19
590.9
374.63
134.72
742.32
WASH340

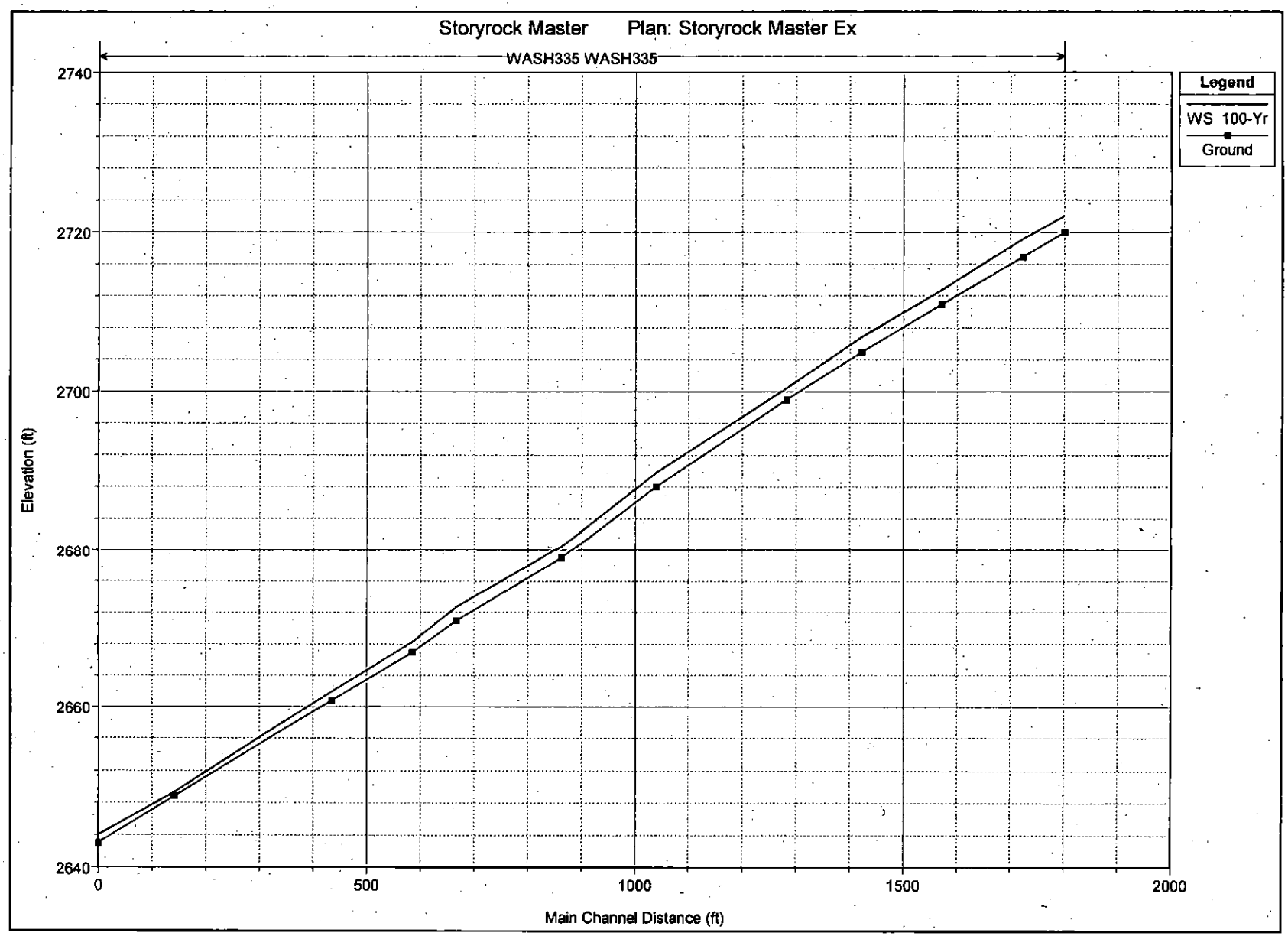

Storyrock Master Plan: Storyrock Master Ex
WASH215 WASH215
Legend
WS 100-Yr
Ground
Elevation (ft)
2700
2680
2660
2640
2620
2600
2580
2560
2540
0
500
1000
1500
2000
2500
3000
3500
4000
Main Channel Distance (ft)


Storyrock Master Plan: Storyrock Master Ex
WASH303 WASH303
Legend
WS 100-Yr
Ground
Elevation (ft)
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
0
100
200
300
400
500
600
700
800
Main Channel Distance (ft)

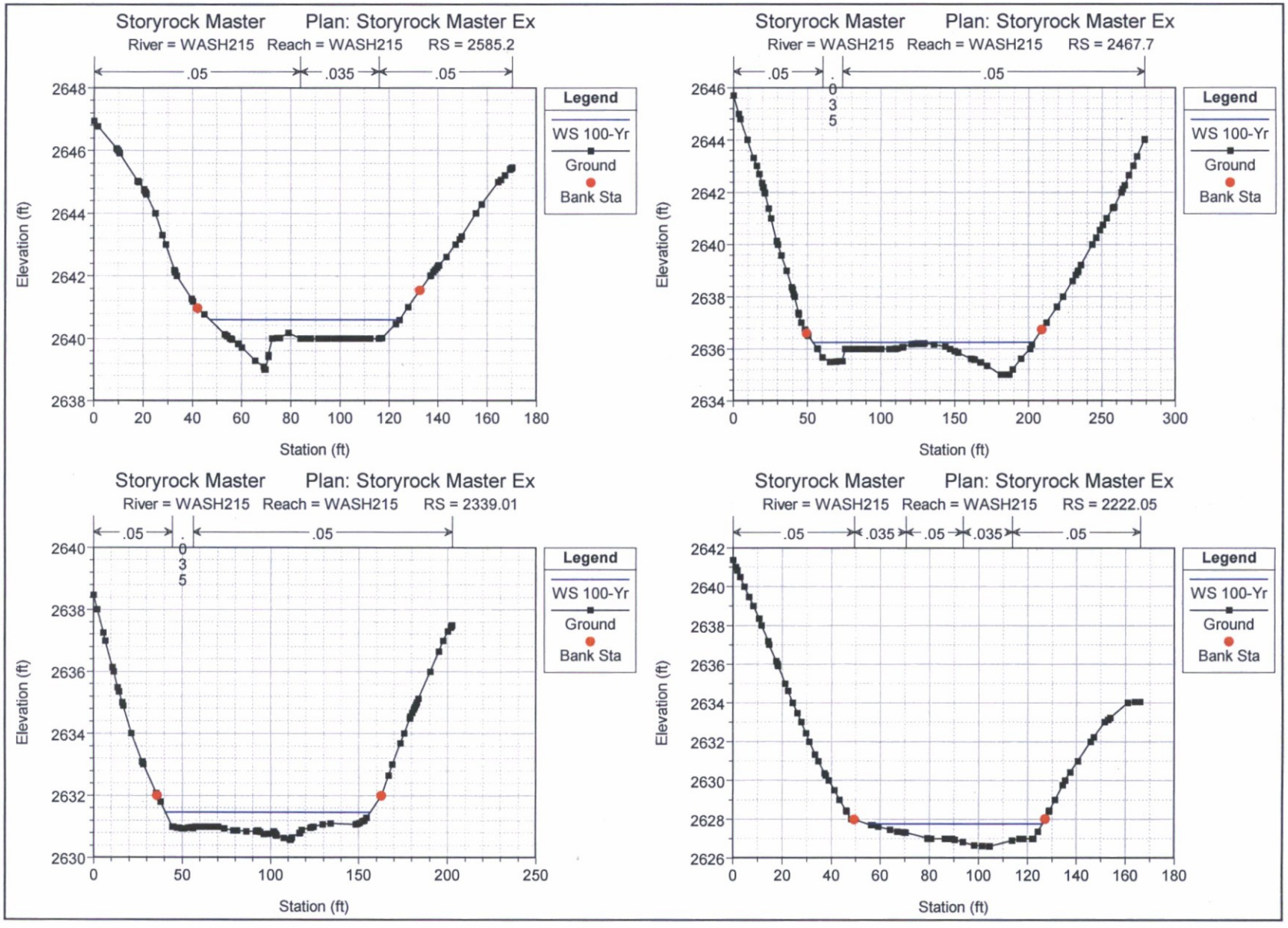

Storyrock Master Plan: Storyrock Master Ex
WASH304 WASH304
Legend
WS 100-Yr
Ground
Elevation (ft)
2780
2770
2760
2750
2740
2730
2720
0
200
400
600
800
1000
1200
Main Channel Distance (ft)

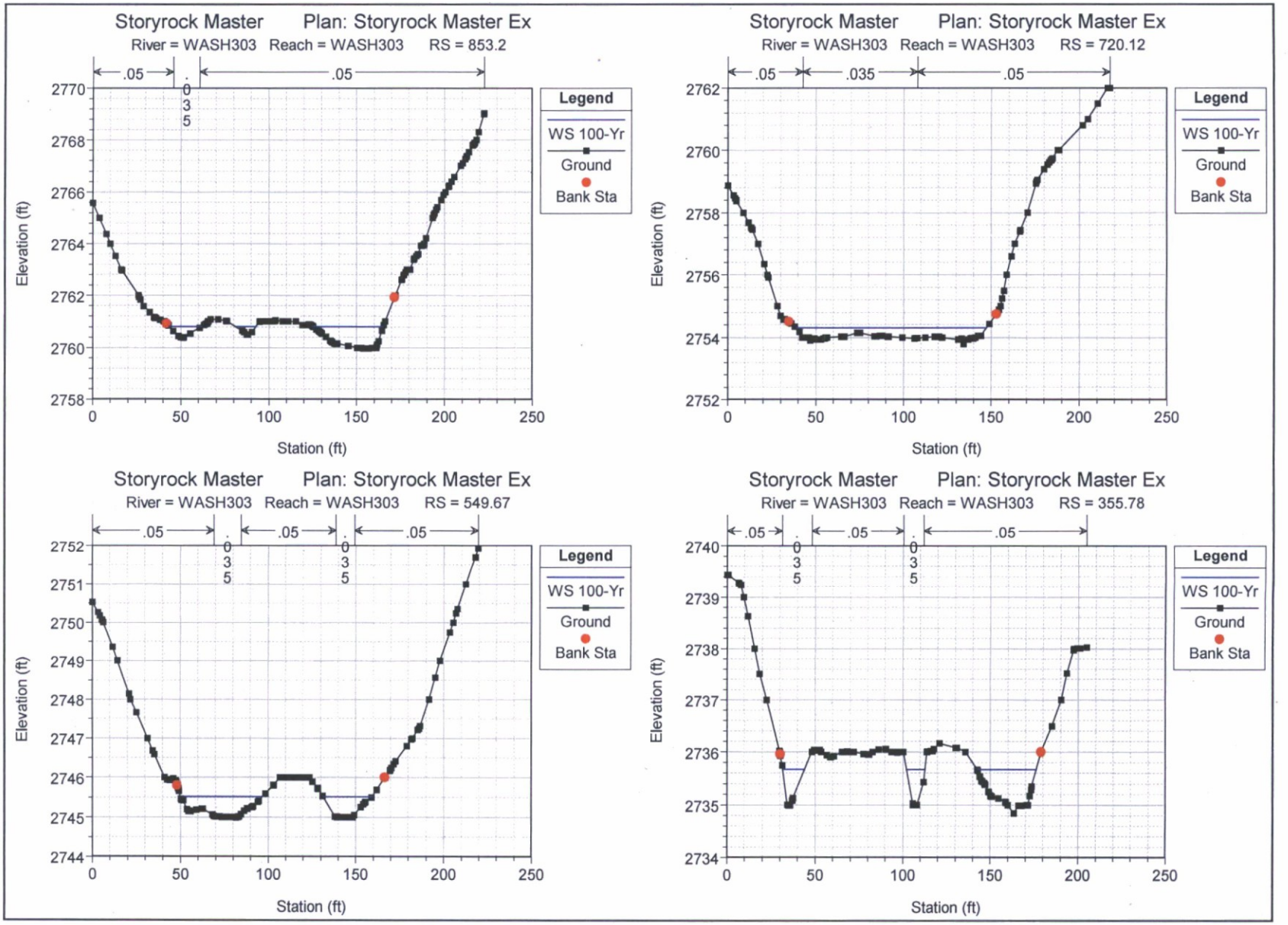

Storyrock Master Plan: Storyrock Master Ex
WASH305 WASH305
Legend
WS 100-Yr
Ground
Elevation (ft)
2720
2700
2680
2660
2640
2620
2600
0
500
1000
1500
2000
2500
Main Channel Distance (ft)

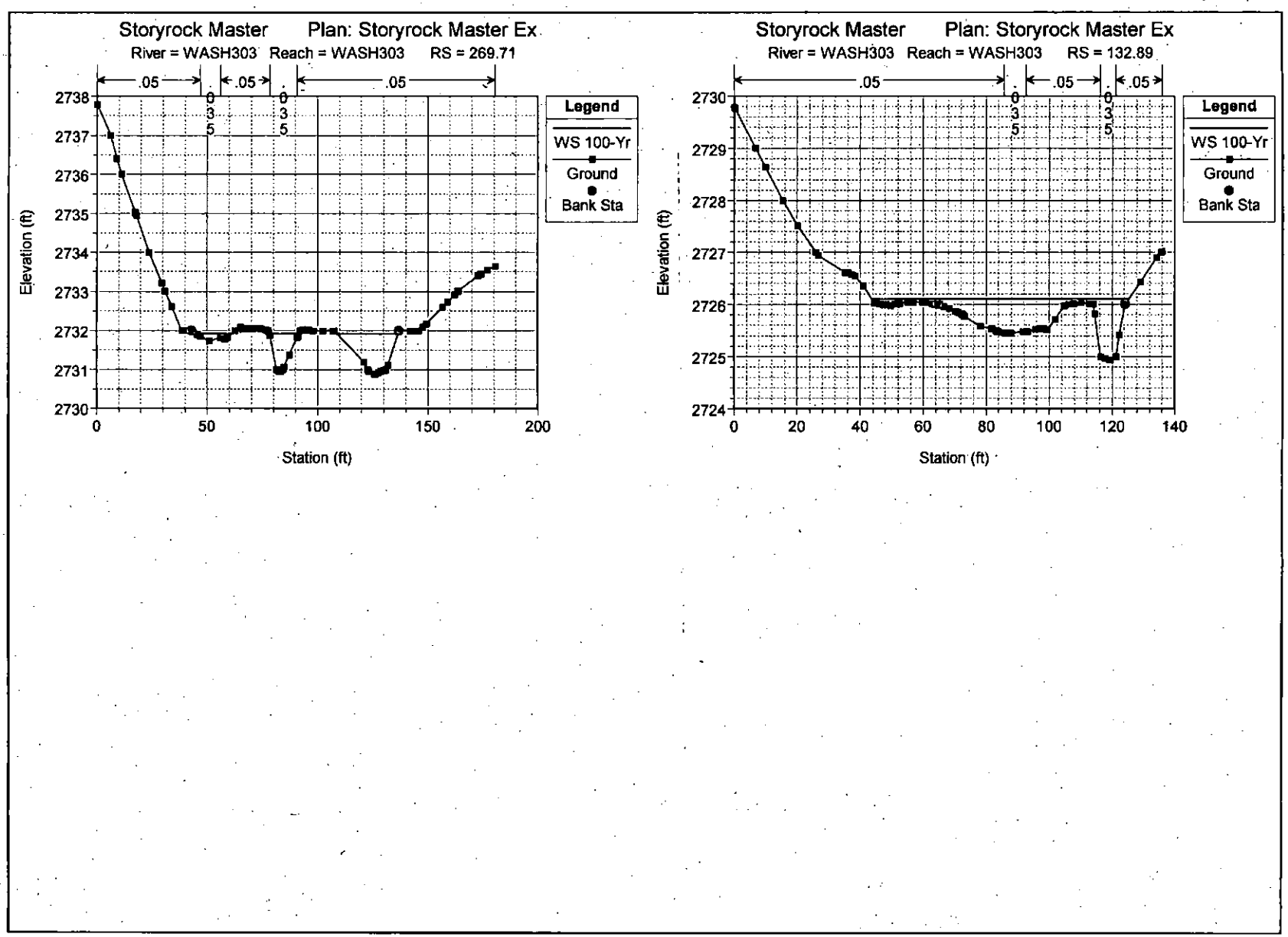

Storyrock Master Plan: Storyrock Master Ex
WASH310 WASH310
Legend
WS 100-Yr
Ground
Elevation (ft)
2780
2760
2740
2720
2700
2680
2660
2640
2620
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)

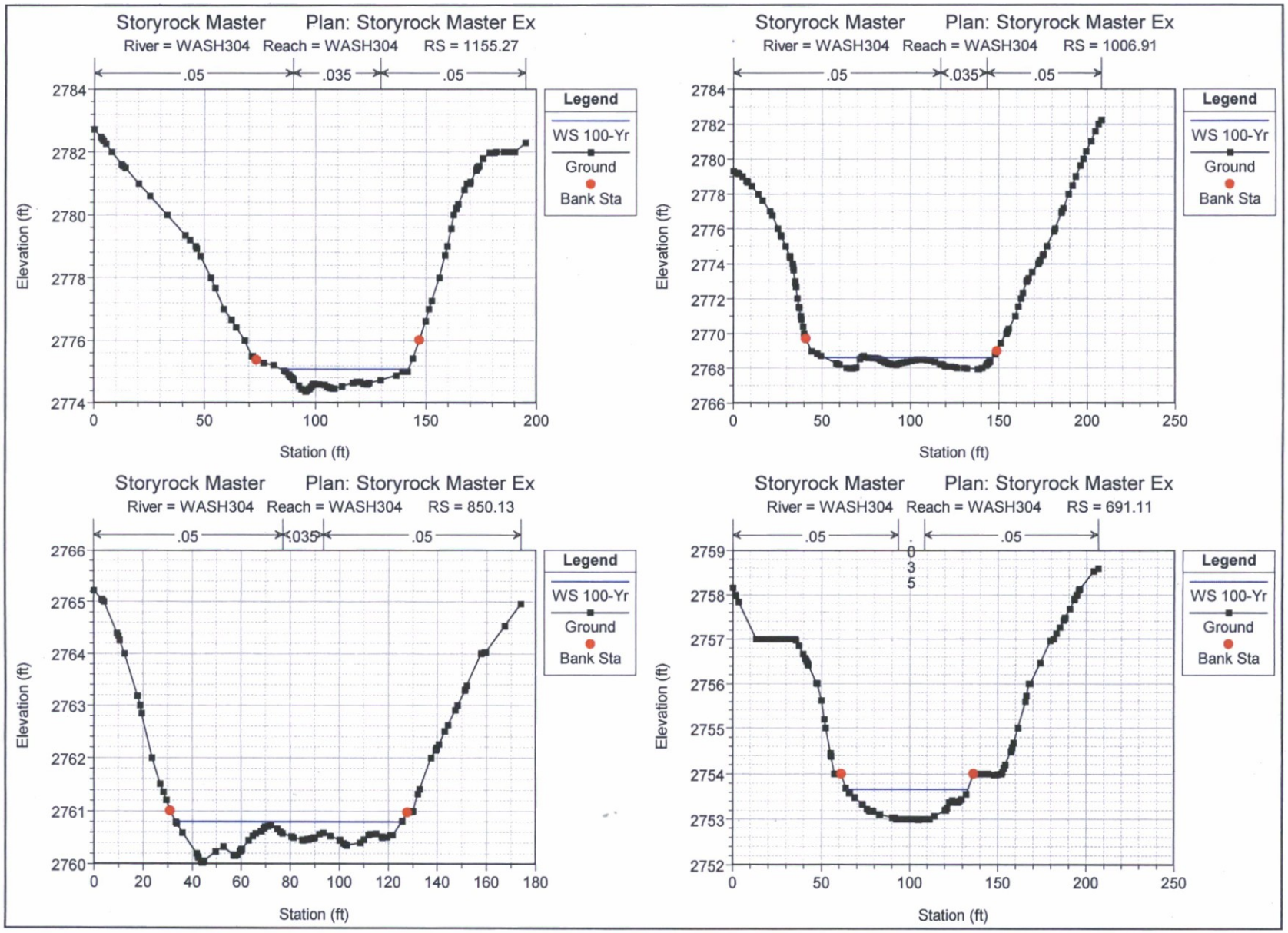

Storyrock Master Plan: Storyrock Master Ex
WASH335 WASH335
Legend
WS 100-Yr
Ground
2740
2720
2700
2680
2660
2640
Elevation (ft)
0
500
1000
1500
2000
Main Channel Distance (ft)

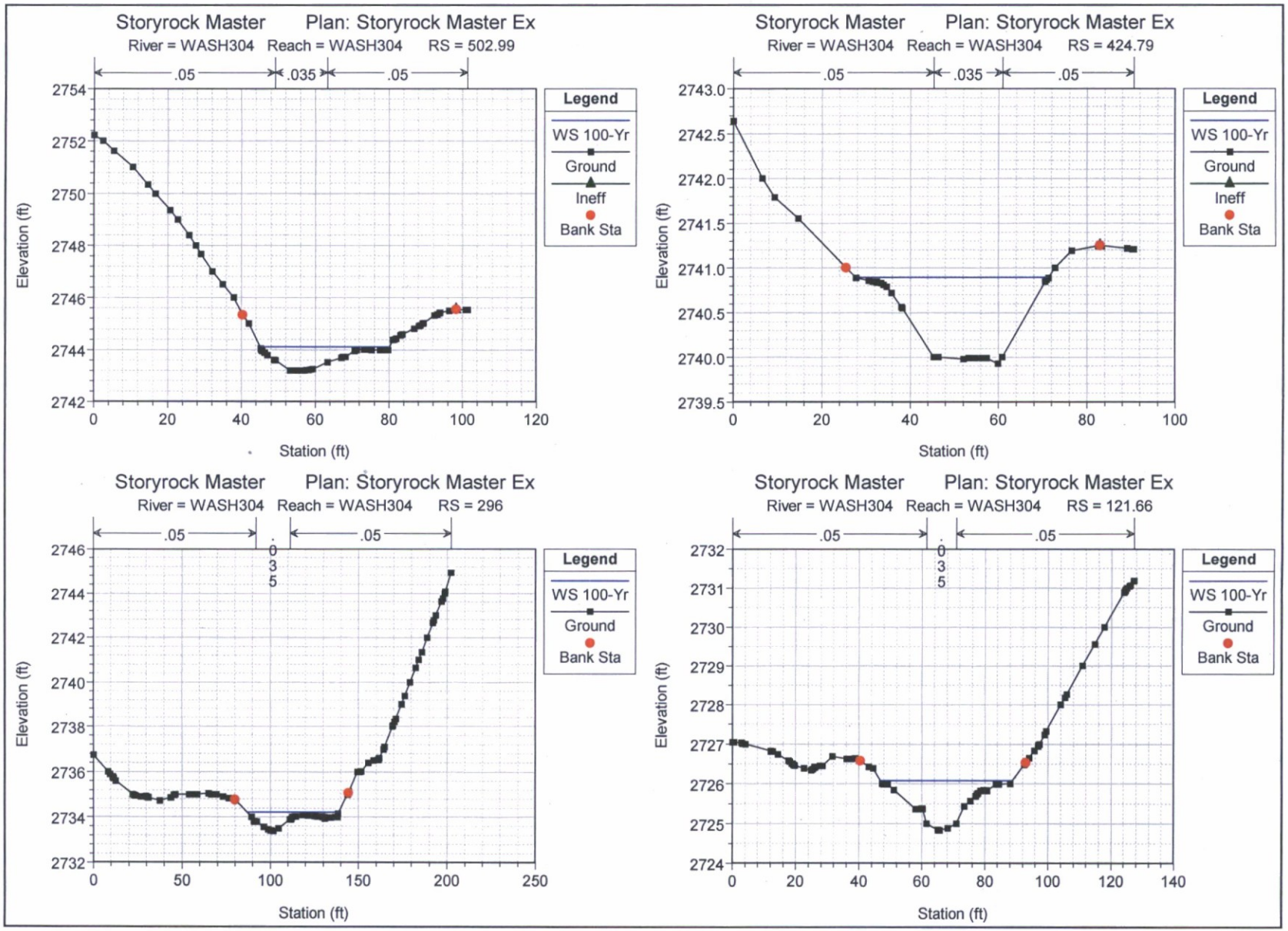

Storyrock Master Plan: Storyrock Master Ex
WASH340 WASH340
Legend
WS 100-Yr
Ground
Elevation (ft)
2690
2680
2670
2660
2650
2640
0
200
400
600
800
1000
Main Channel Distance (ft)

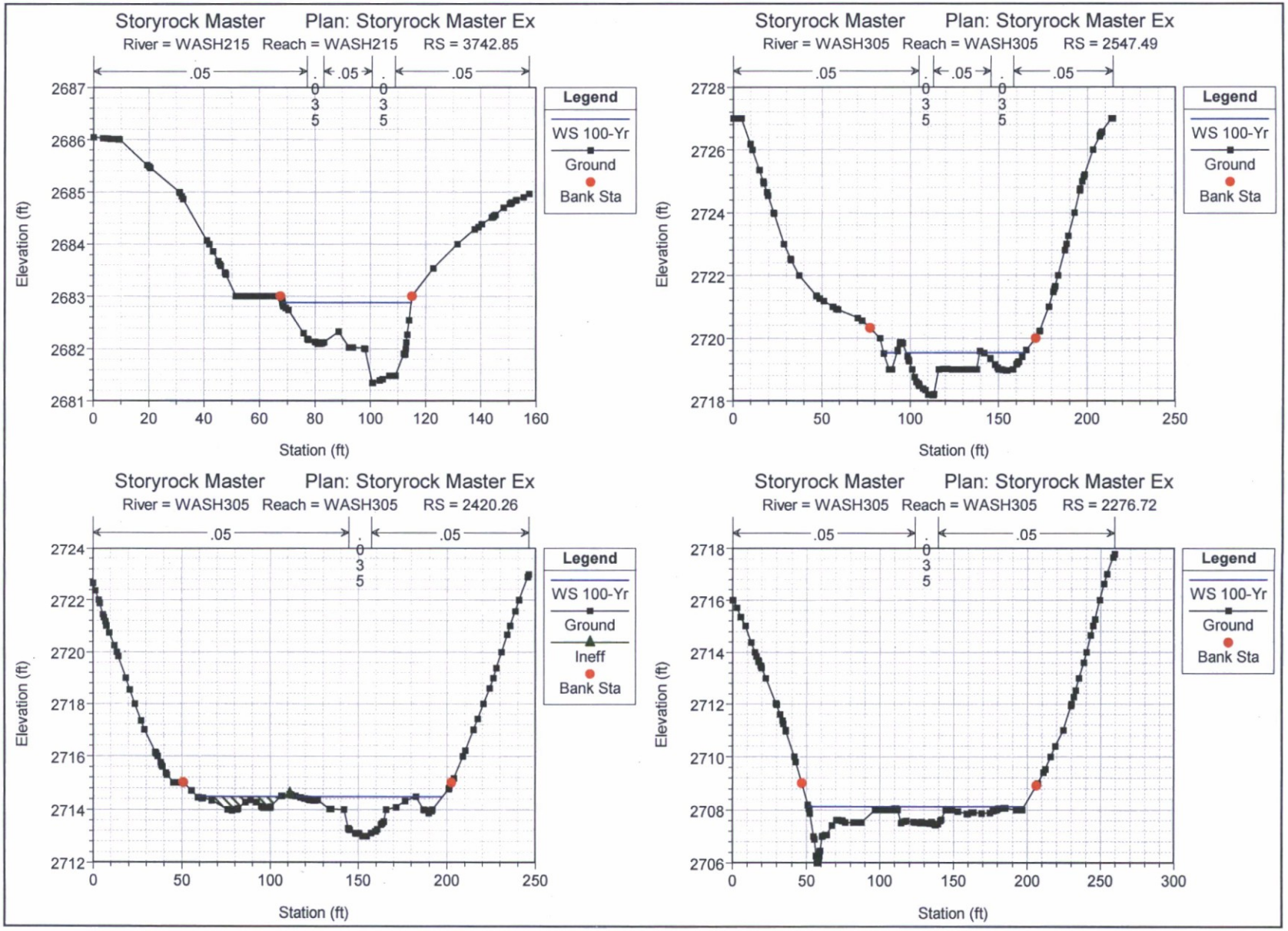

Storyrock Master Plan: Storyrock Master Ex
River = WASH215 Reach = WASH215 RS = 2585.2
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH215 Reach = WASH215 RS = 2467.7
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH215 Reach = WASH215 RS = 2339.01
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH215 Reach = WASH215 RS = 2222.05
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

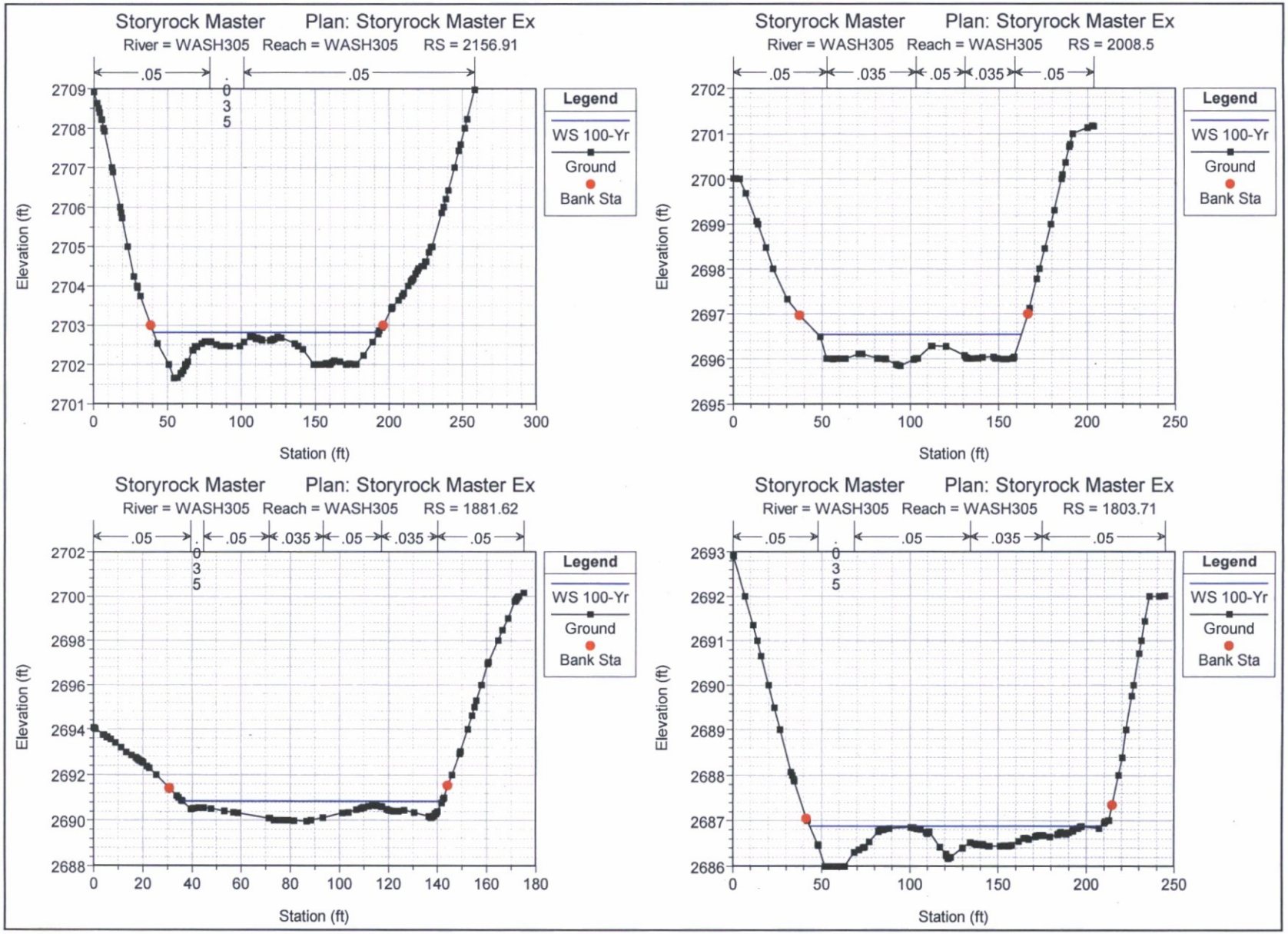

Storyrock Master Plan: Storyrock Master Ex
River = WASH303 Reach = WASH303 RS = 853.2
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH303 Reach = WASH303 RS = 720.12
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH303 Reach = WASH303 RS = 549.67
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH303 Reach = WASH303 RS = 355.78
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

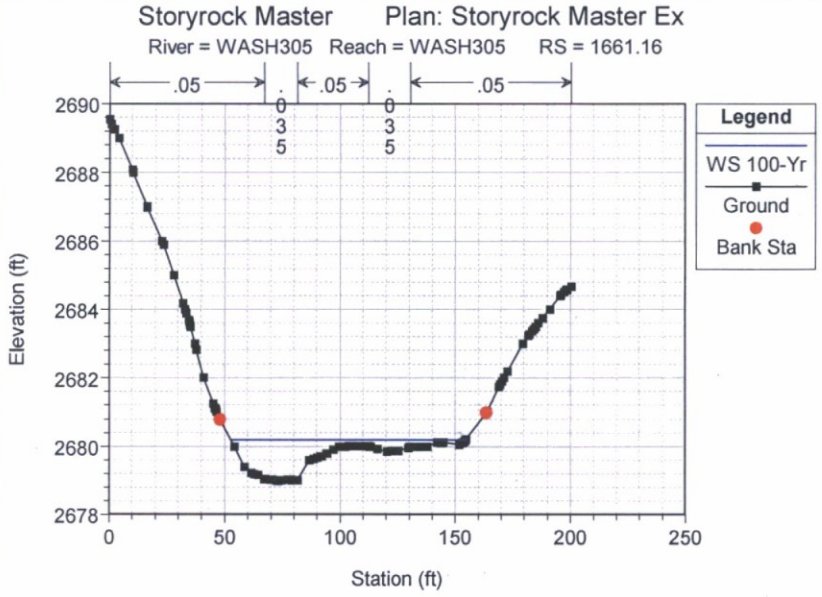

Storyrock Master Plan: Storyrock Master Ex
River = WASH303 Reach = WASH303 RS = 269.71
.05
.05
.05
0.035
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
2738
2737
2736
2735
2734
2733
2732
2731
2730
0
50
100
150
200
Storyrock Master Plan: Storyrock Master Ex
River = WASH303 Reach = WASH303 RS = 132.89
.05
.05
.05
0.035
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
2730
2729
2728
2727
2726
2725
2724
0
20
40
60
80
100
120
140

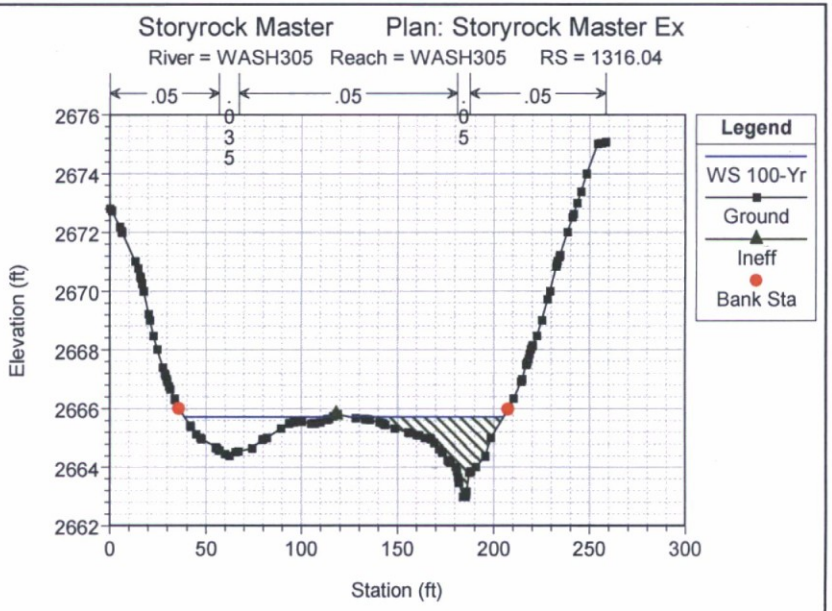

Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 1155.27
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 1006.91
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 850.13
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 691.11
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta

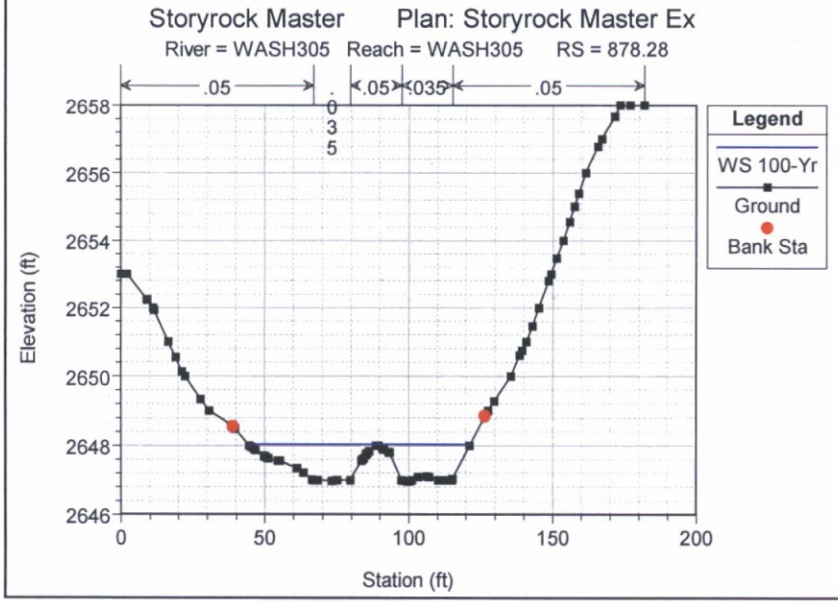

Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 502.99
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Ineff
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 424.79
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Ineff
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 296
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH304 Reach = WASH304 RS = 121.66
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta


Storyrock Master Plan: Storyrock Master Ex
River = WASH215 Reach = WASH215 RS = 3742.85
.05
.05
.05
.035
.035
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 2547.49
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 2420.26
Ineff
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 2276.72


Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 2156.91
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 2008.5
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 1881.62
.05
.035
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 1803.71
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 1661.16
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 1316.04
.05
.035
.05
.05
Legend
WS 100-Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 878.28
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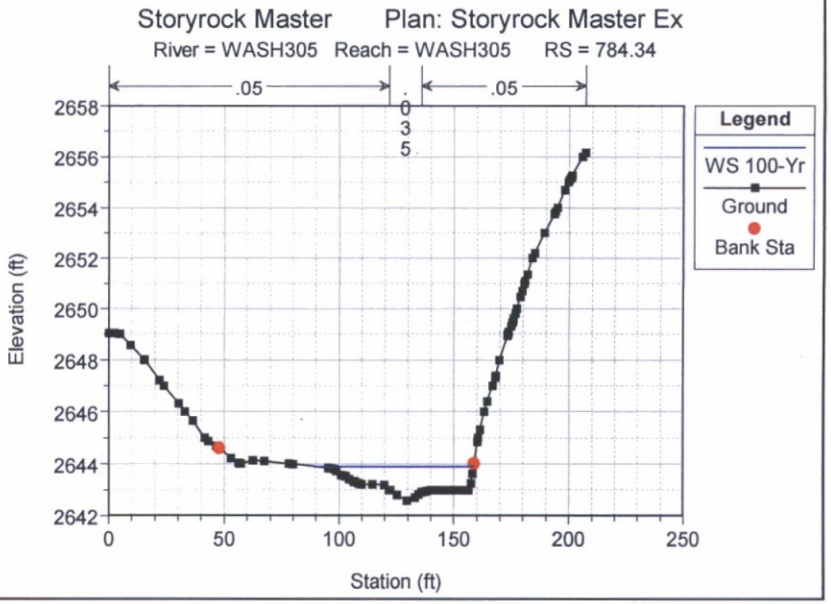
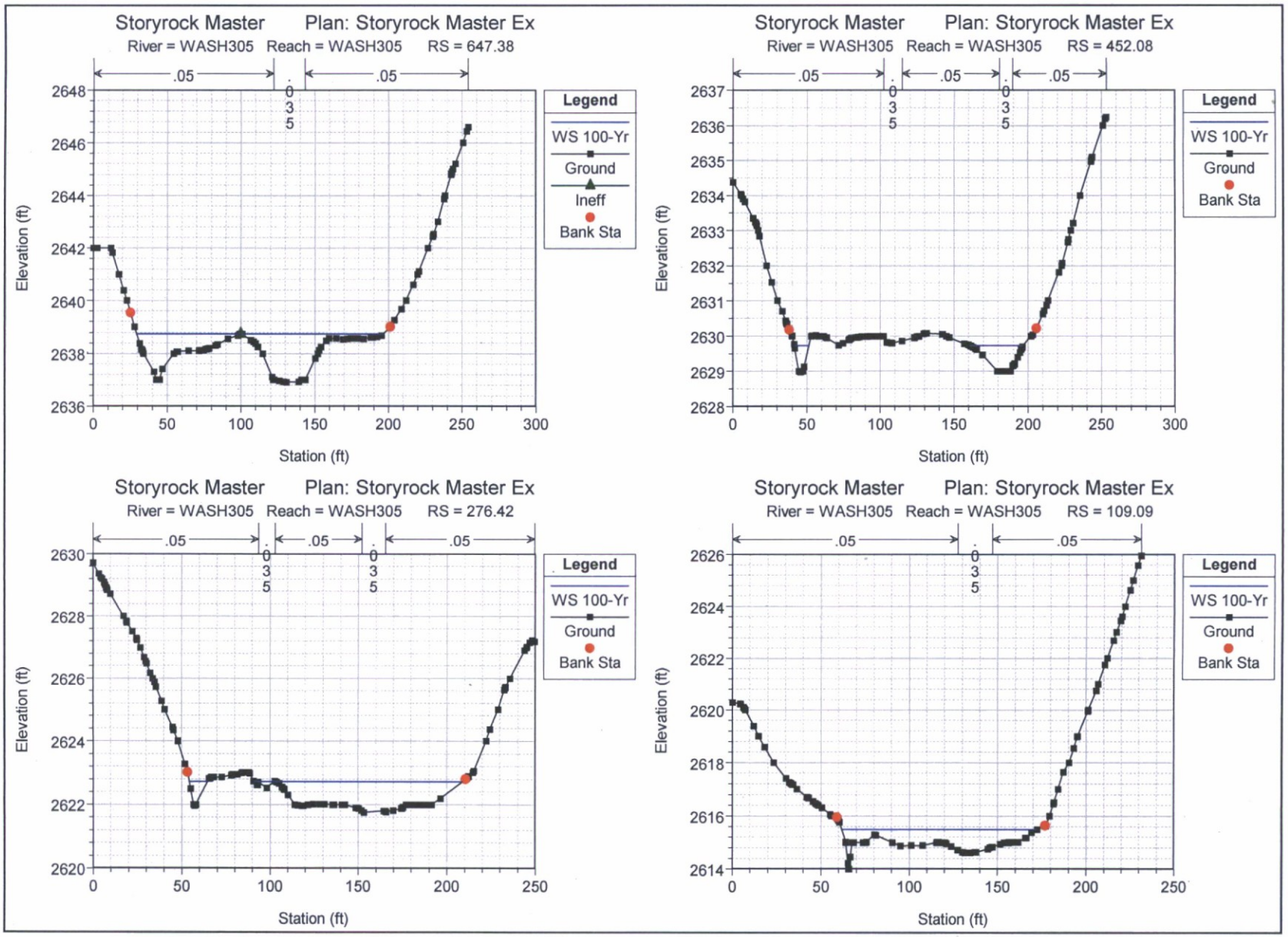
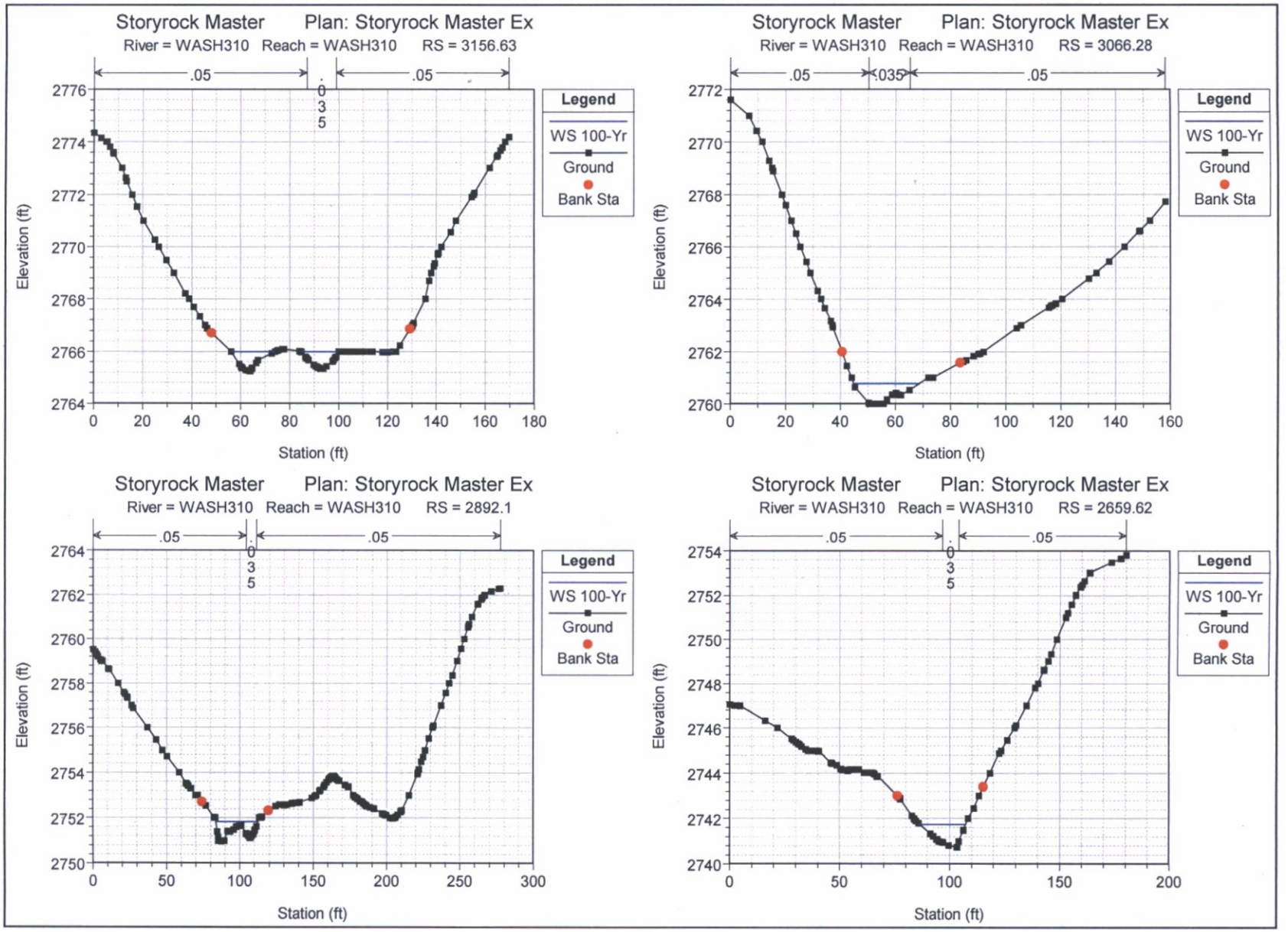
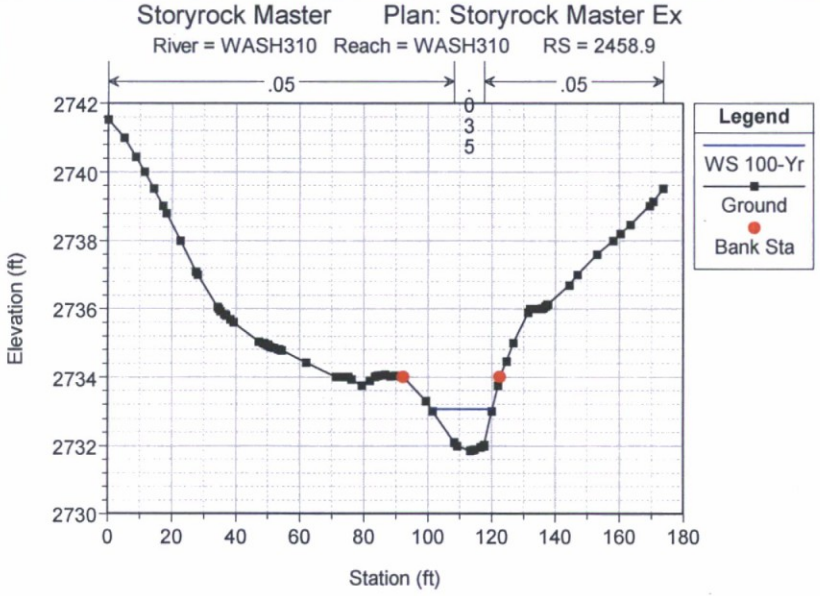
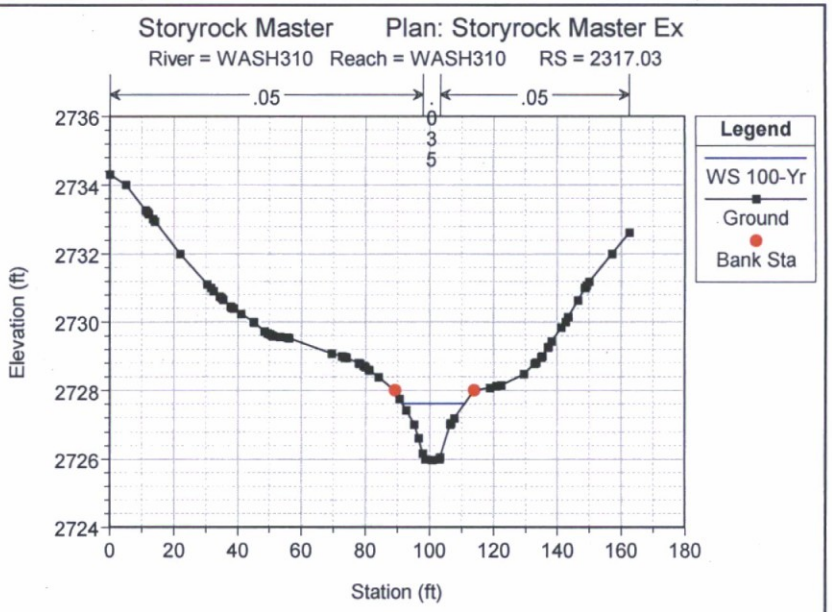
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

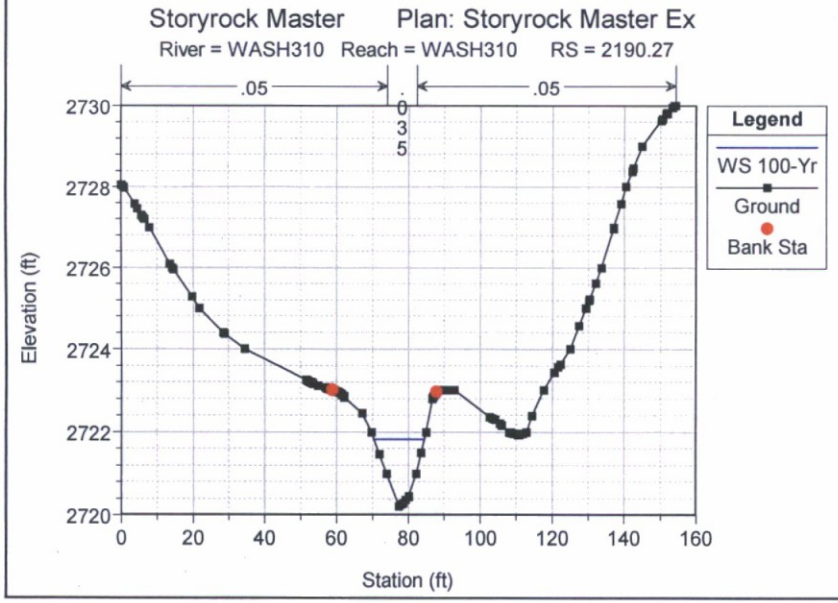

Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 784.34
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

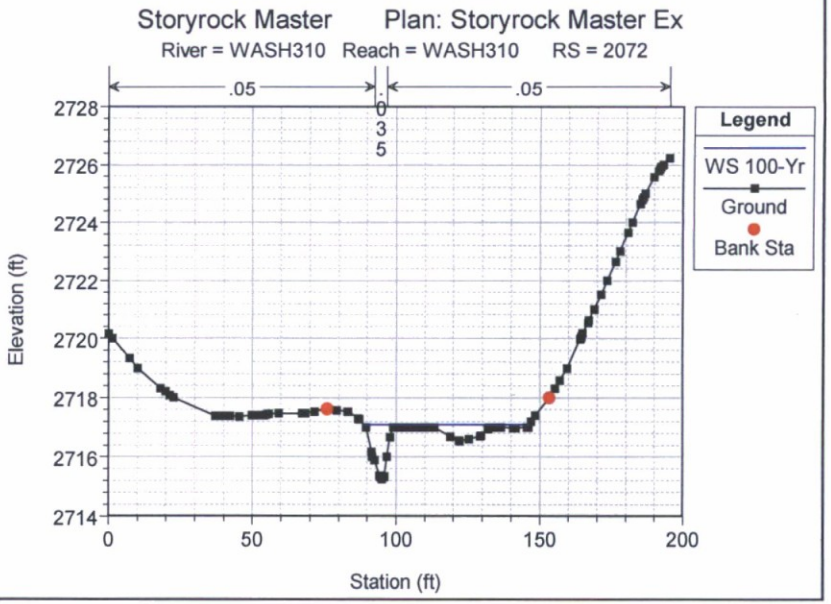

Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 647.38
.05
.05
.035
Legend
WS 100-Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 452.08
.05
.05
.05
.035
.035
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 276.42
.05
.05
.05
.035
.035
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH305 Reach = WASH305 RS = 109.09
.05
.05
.035
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

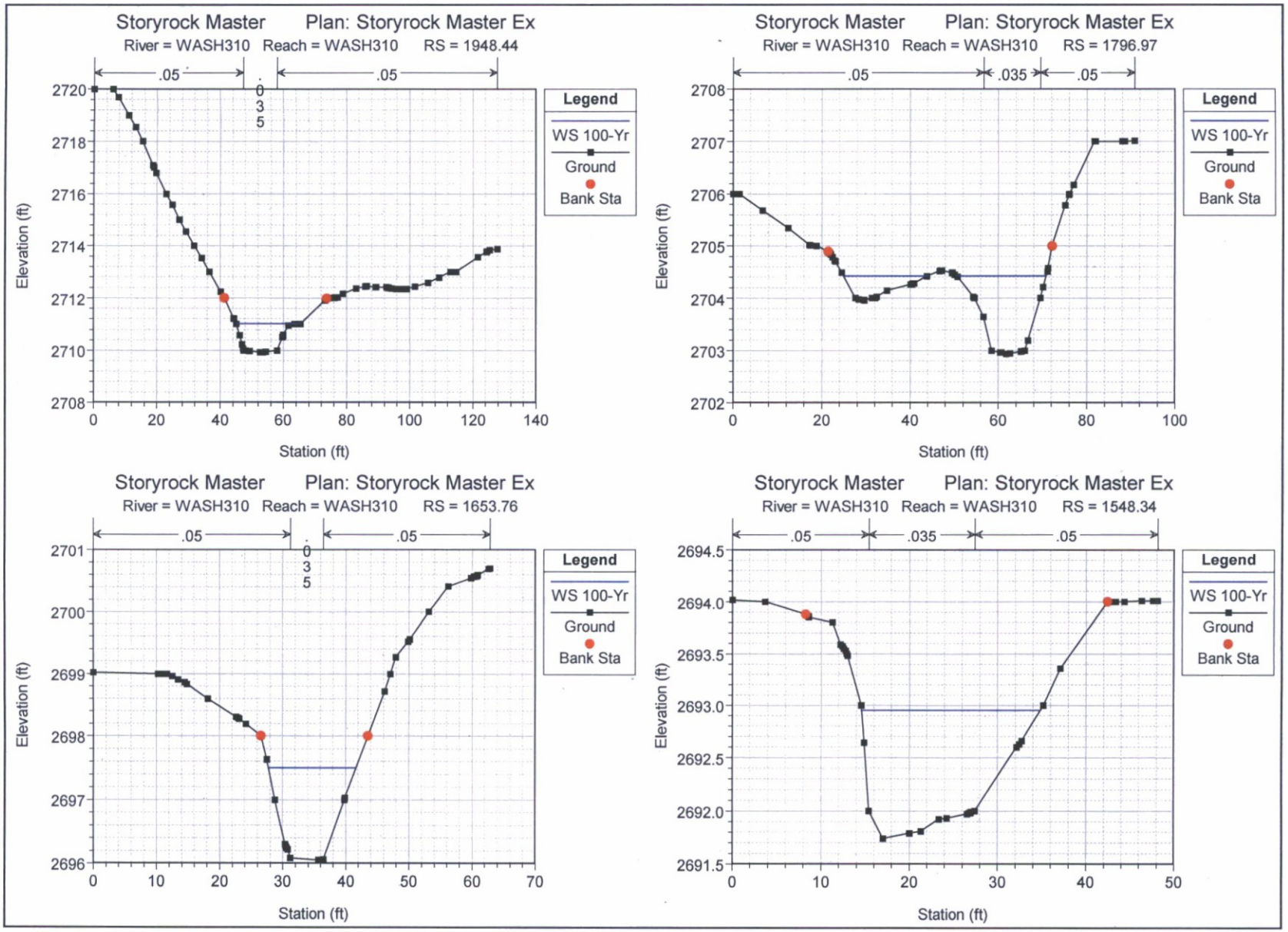

Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 3156.63
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 3066.28
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 2892.1
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 2659.62
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

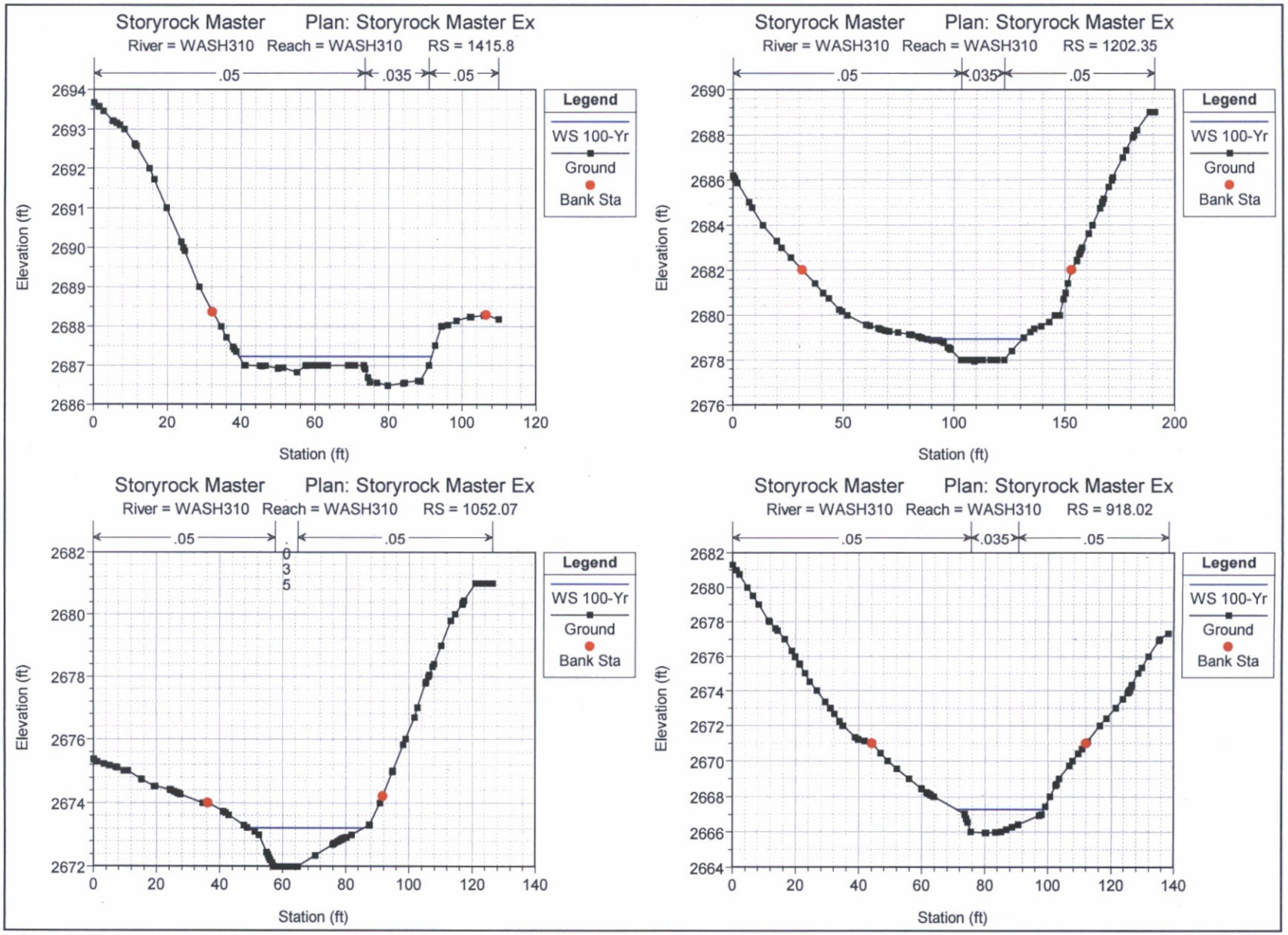

Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 2458.9
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

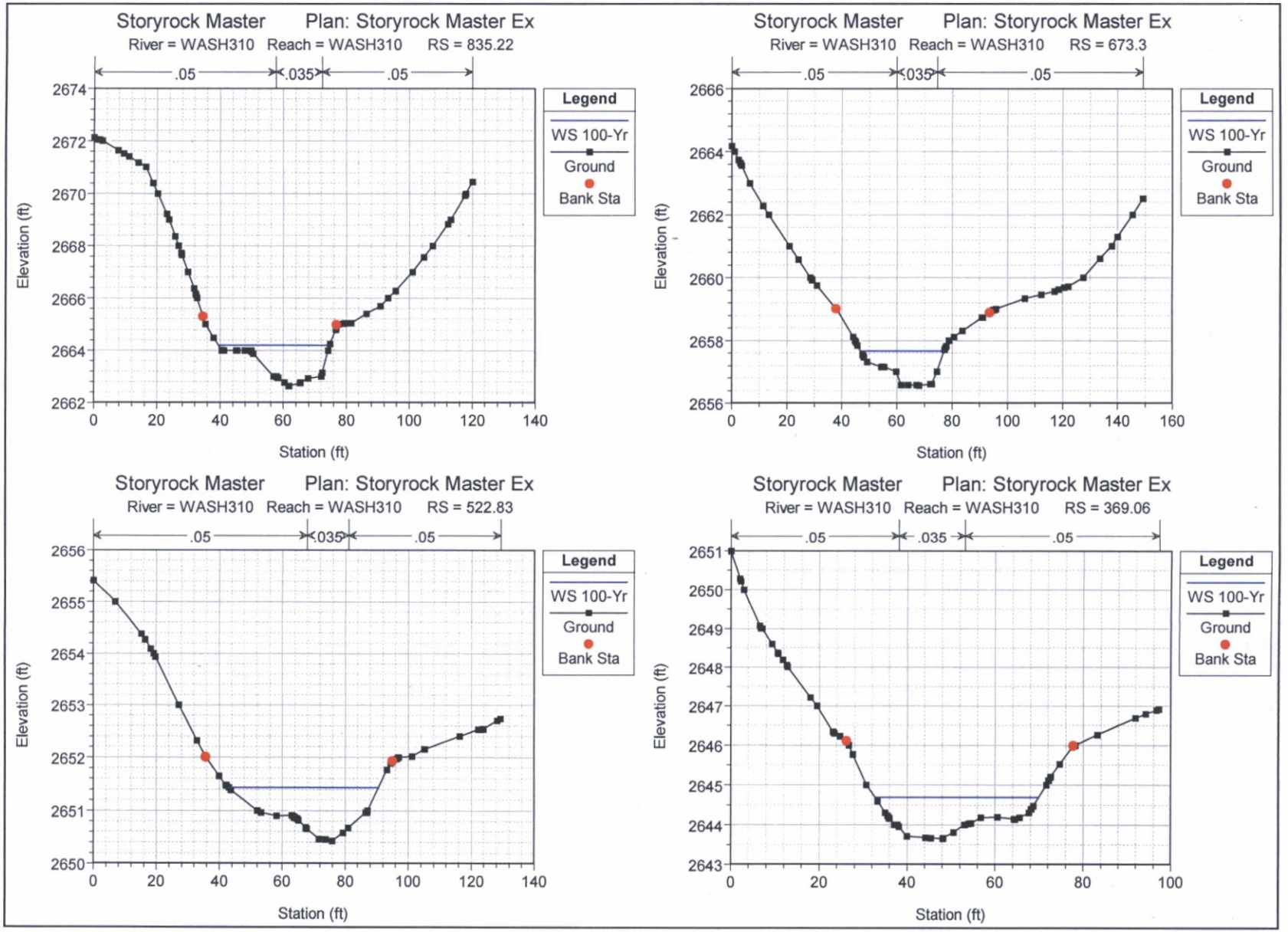

Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 2317.03
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 2190.27
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 2072
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 1948.44
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 1796.97
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 1653.76
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 1548.34
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 1415.8
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 1202.35
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 1052.07
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 918.02
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 835.22
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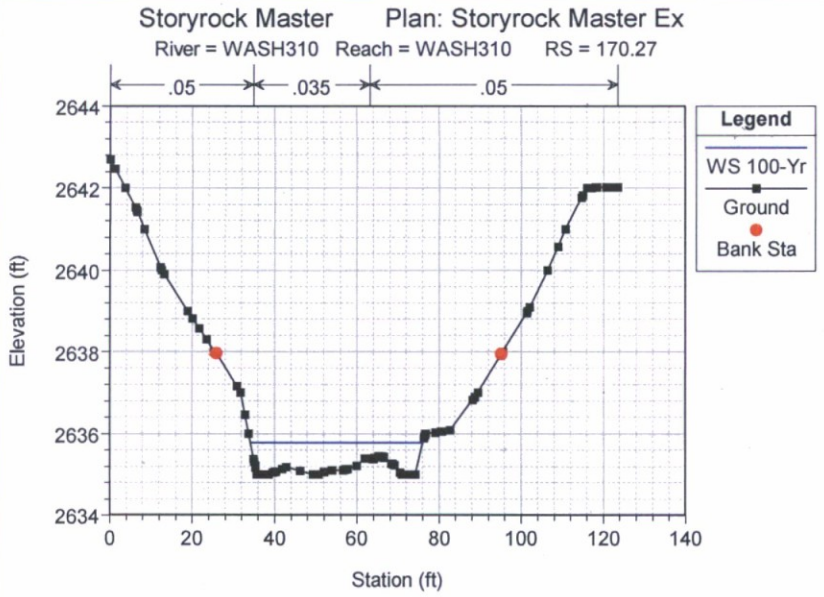
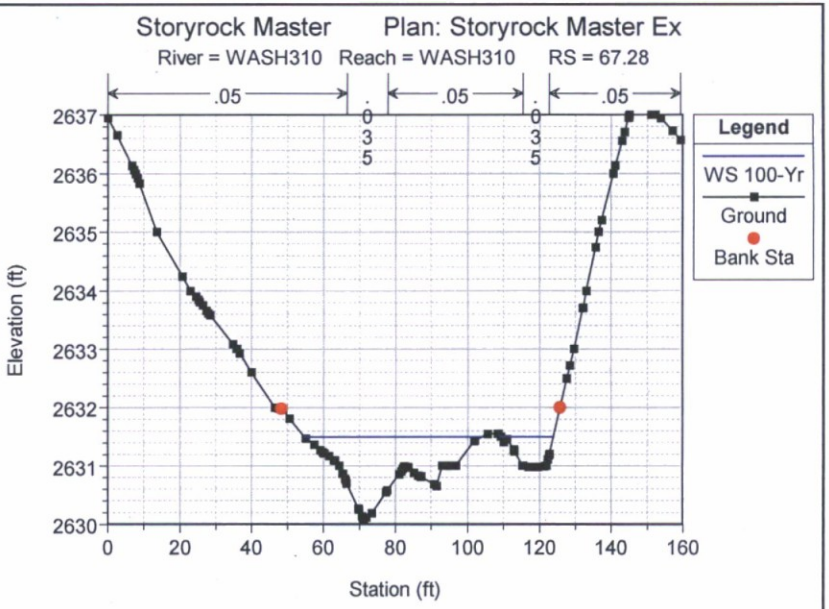
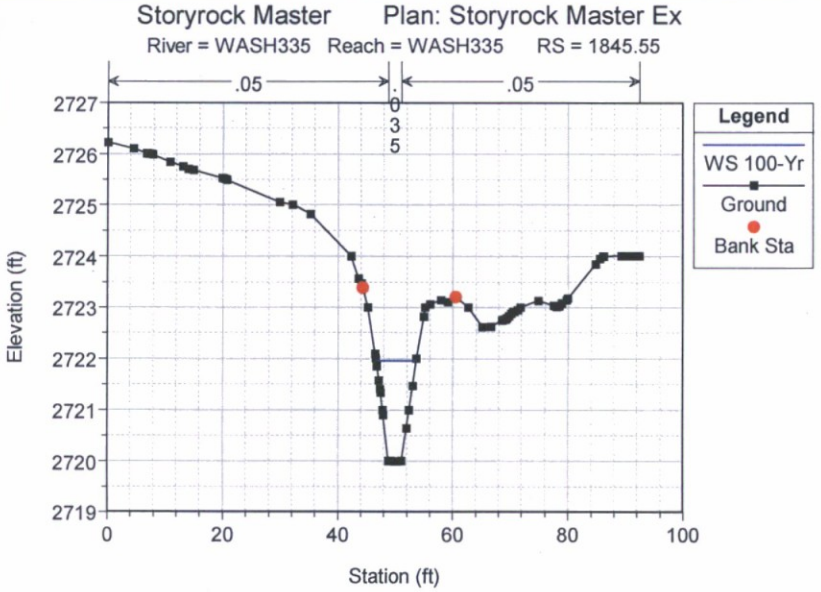
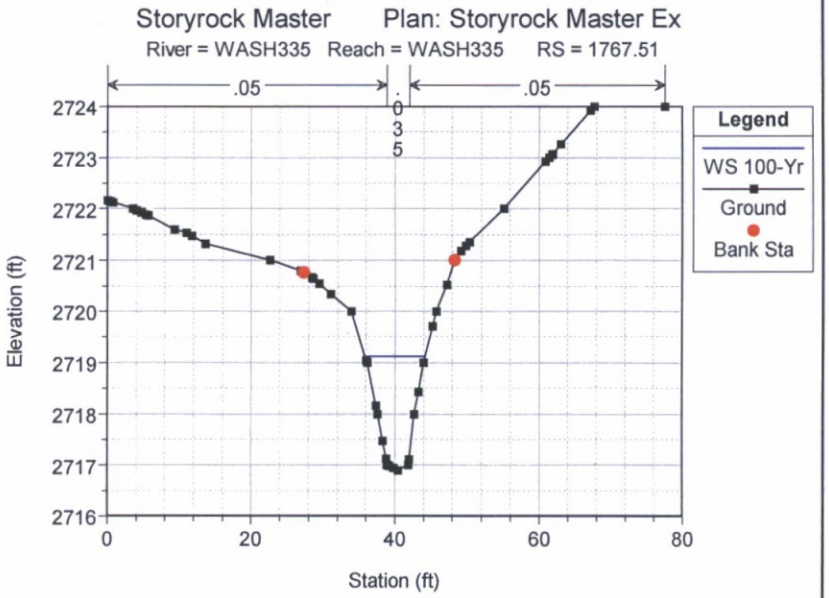
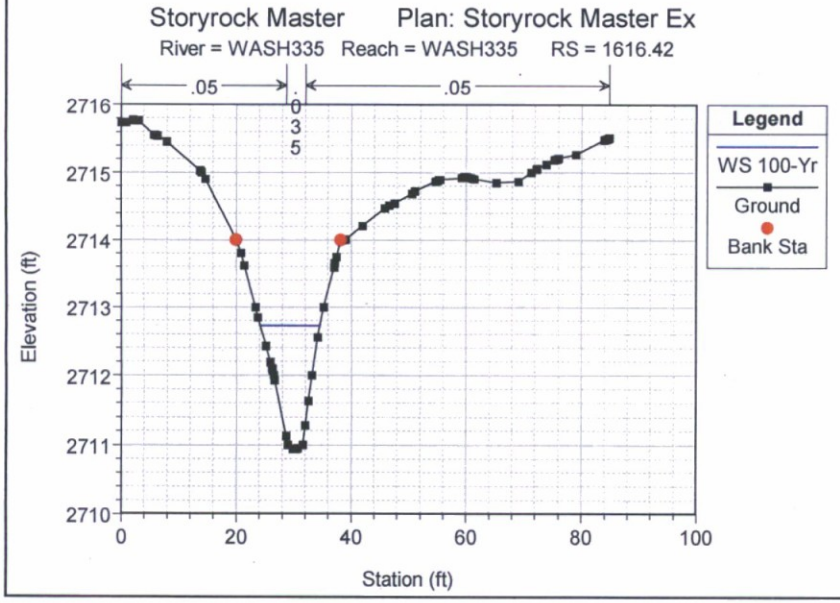
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 673.3
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 522.83
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 369.06
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
Ground
Bank Sta


Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 170.27
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
2644
2642
2640
2638
2636
2634
0
20
40
60
80
100
120
140


Storyrock Master Plan: Storyrock Master Ex
River = WASH310 Reach = WASH310 RS = 67.28
.05
.035
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
2637
2636
2635
2634
2633
2632
2631
2630
0
20
40
60
80
100
120
140
160


Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 1845.55
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 1767.51
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 1616.42
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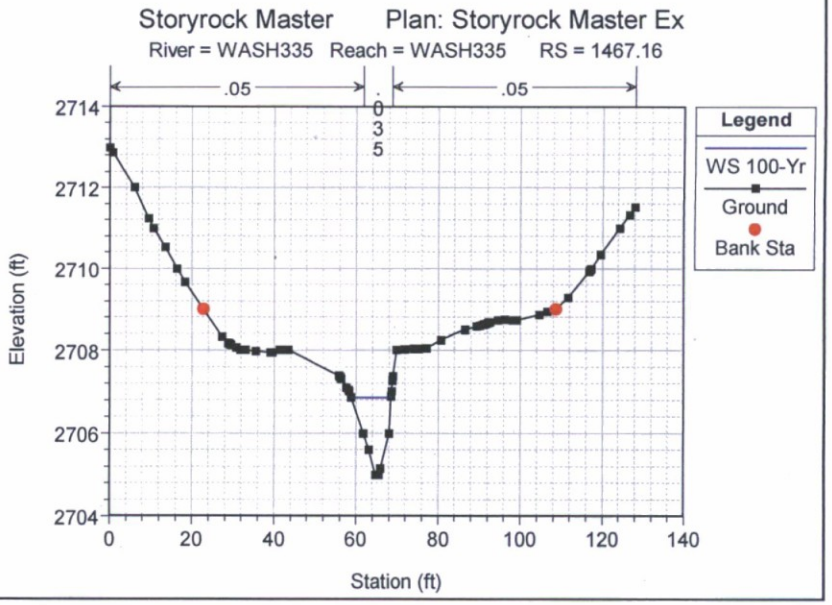
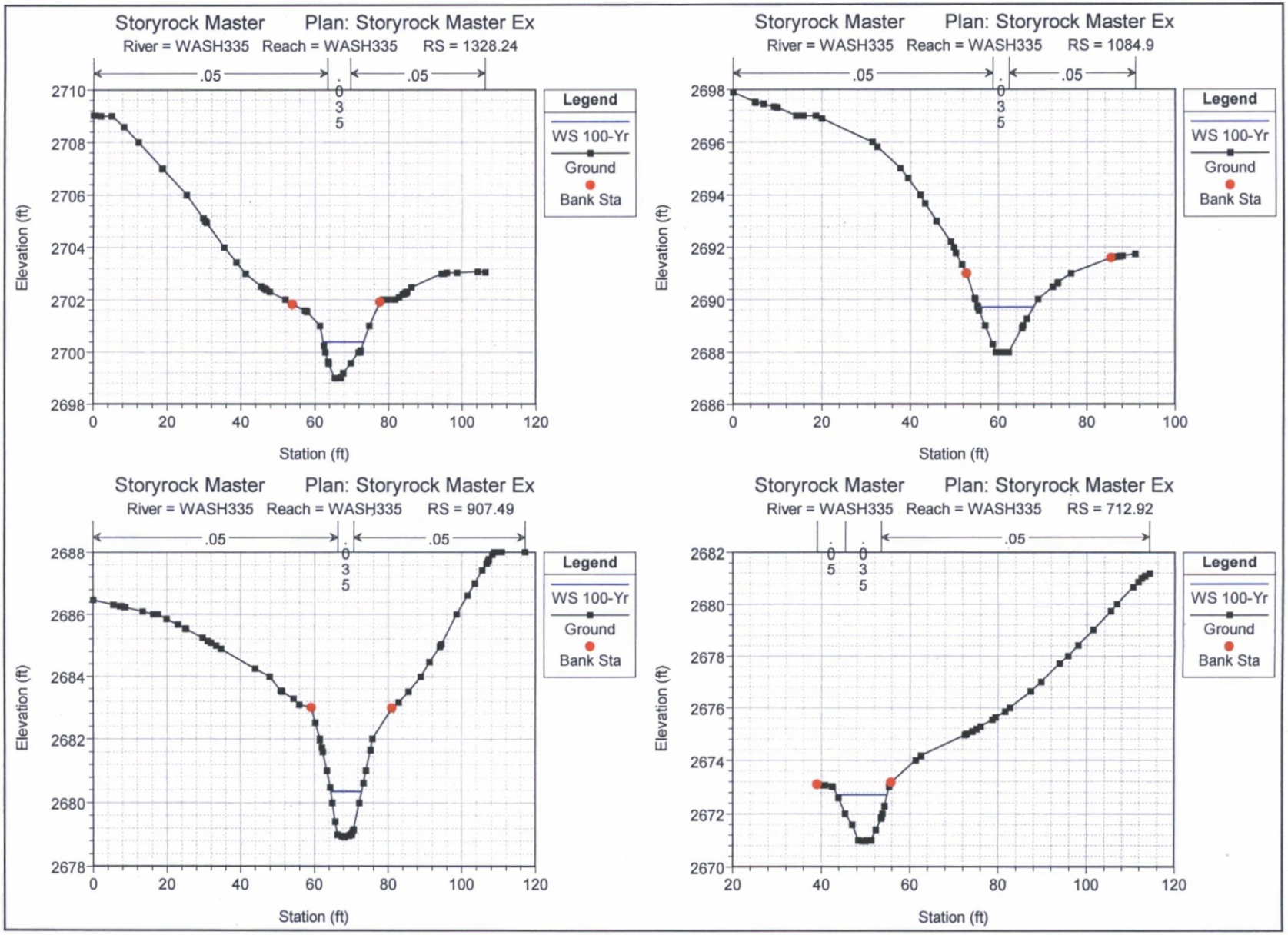
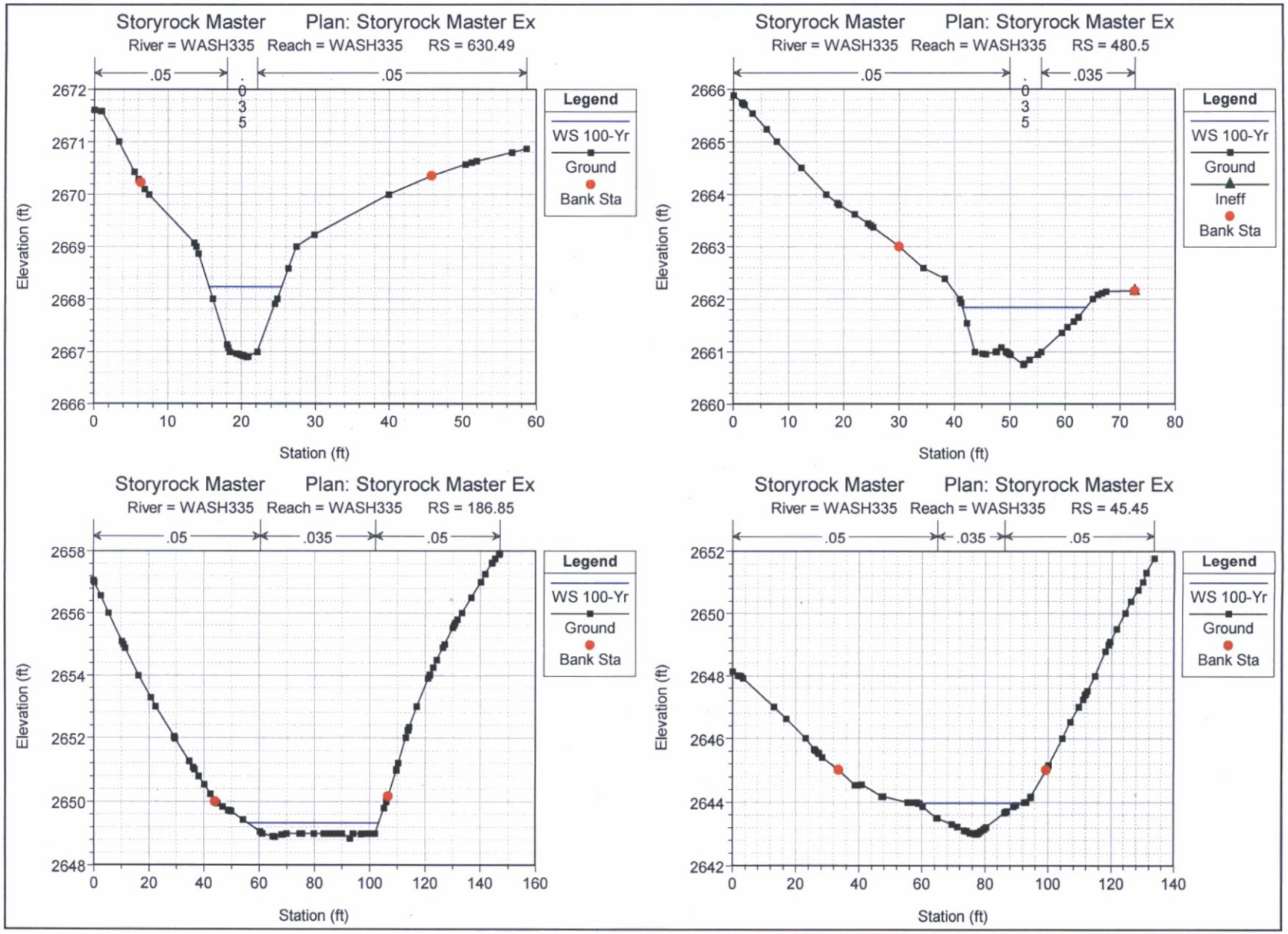
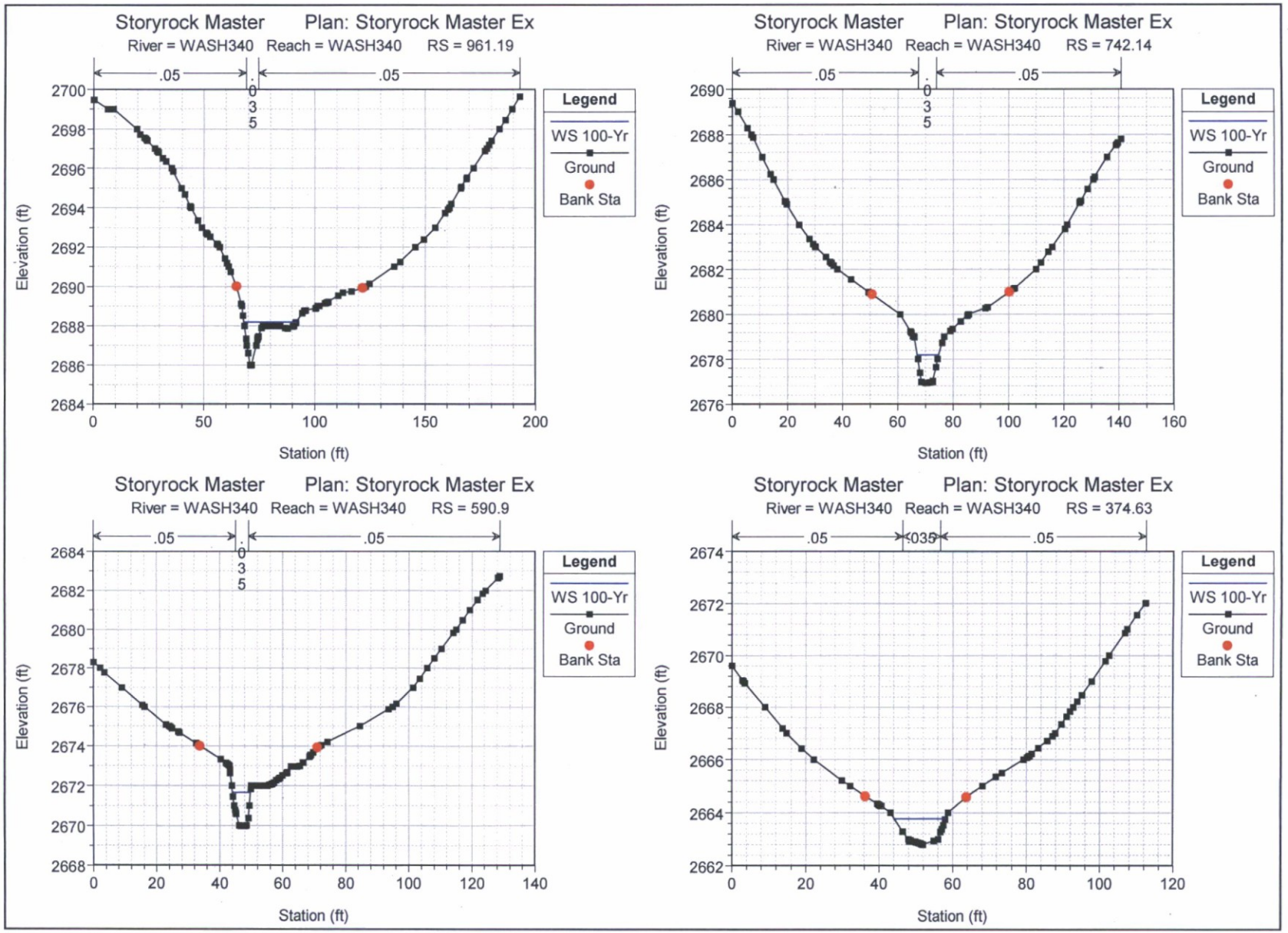
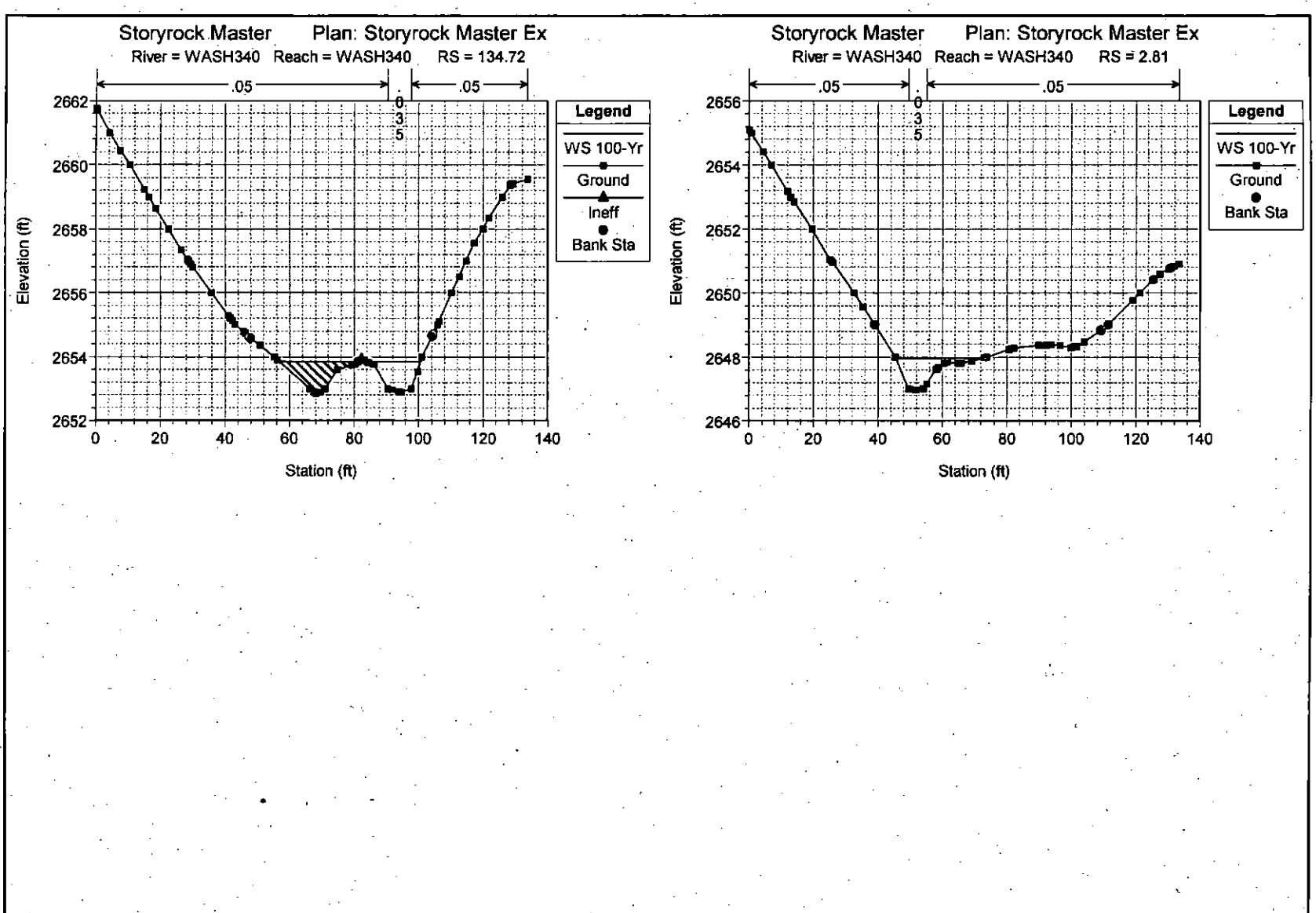
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 1467.16
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 1328.24
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 1084.9
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 907.49
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 712.92
.05
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 630.49
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 480.5
.05
.035
.035
Legend
WS 100-Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 186.85
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH335 Reach = WASH335 RS = 45.45
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Ex
River = WASH340 Reach = WASH340 RS = 961.19
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH340 Reach = WASH340 RS = 742.14
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH340 Reach = WASH340 RS = 590.9
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH340 Reach = WASH340 RS = 374.63
.05
.035
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

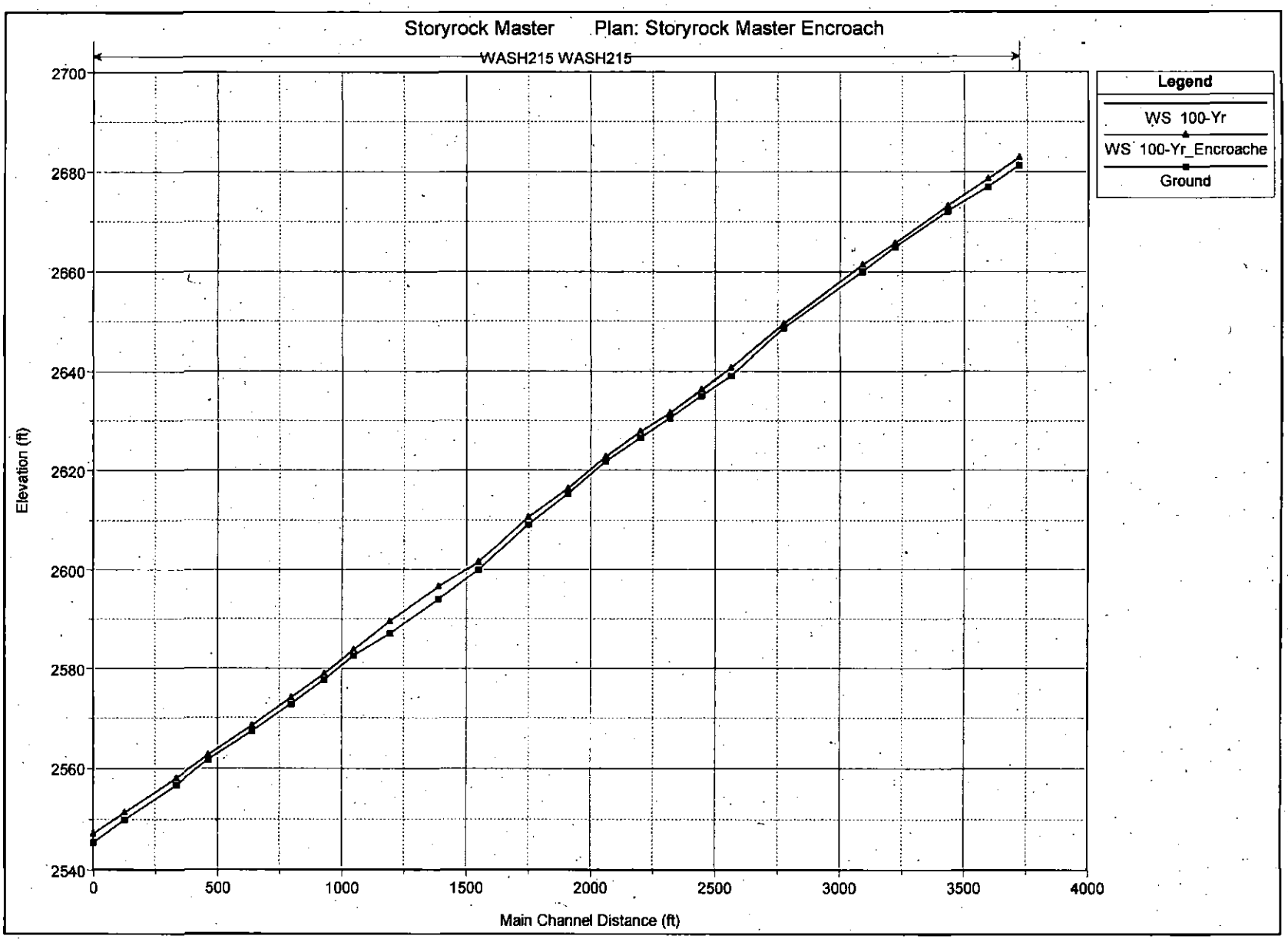

Storyrock Master Plan: Storyrock Master Ex
River = WASH340 Reach = WASH340 RS = 134.72
.05
.03
.05
Legend
WS 100-Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Ex
River = WASH340 Reach = WASH340 RS = 2.81
.05
.03
.05
Legend
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

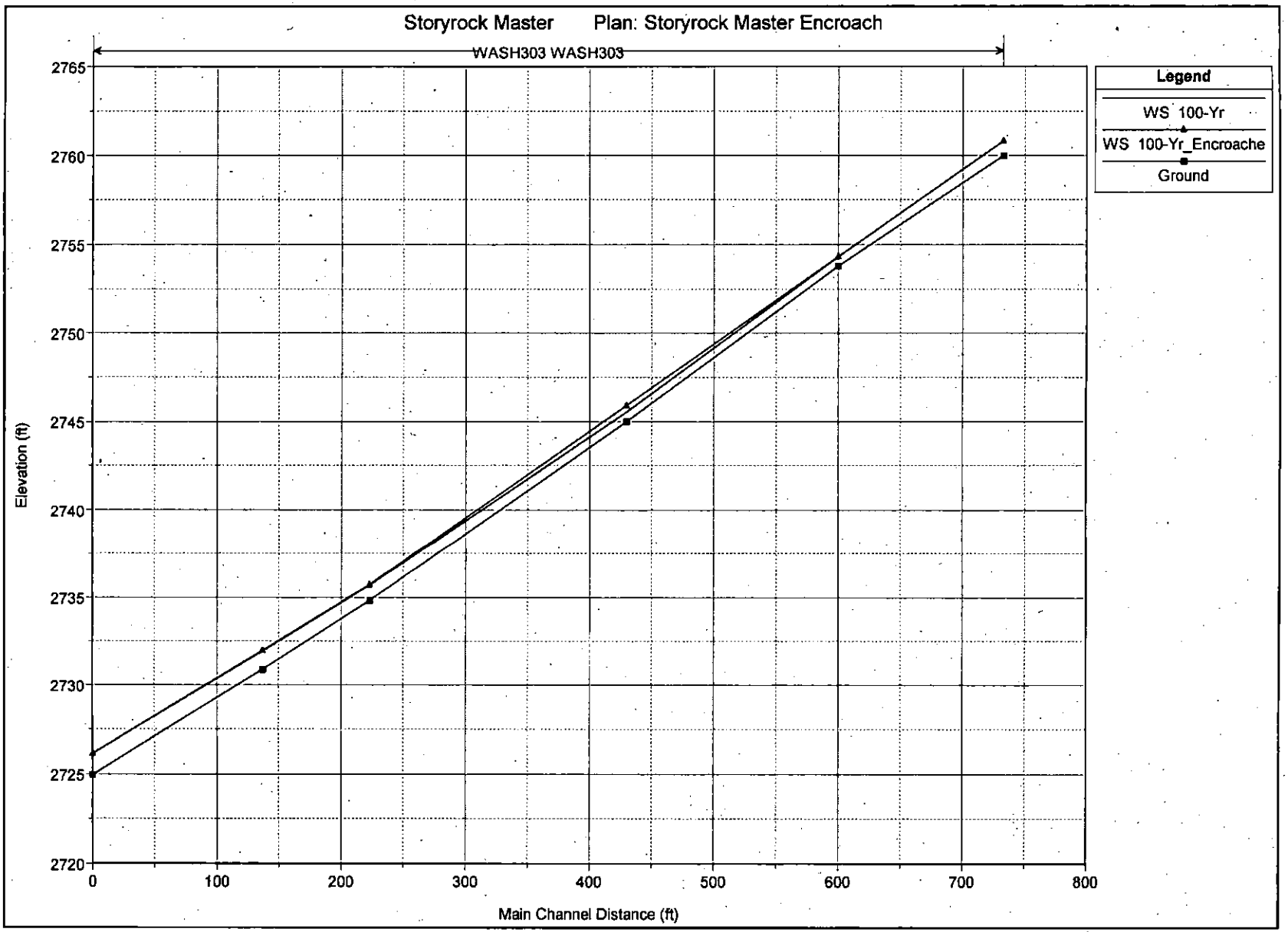
HEC-RAS Plan: Ex Locations: User Defined Profile: 100-Yr

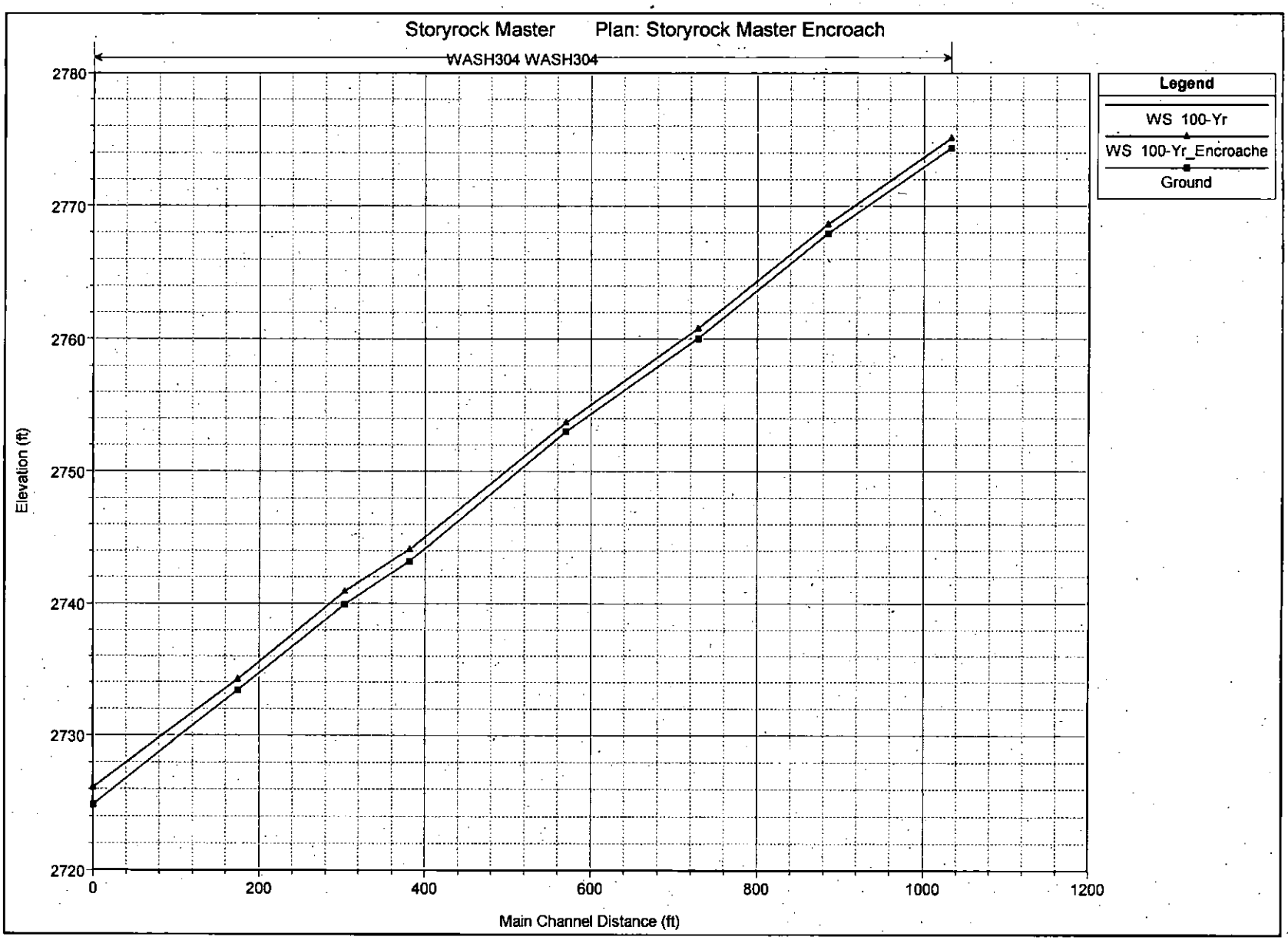
River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
WASH215	WASH215	2585.2	100-Yr	238.00	2638.99	2640.60	2640.64	2640.96	0.034693	4.83	49.31	77.38	1.07
WASH215	WASH215	2467.7	100-Yr	238.00	2635.00	2636.25	2636.23	2636.44	0.032320	3.49	68.22	149.51	0.91
WASH215	WASH215	2339.01	100-Yr	238.00	2630.58	2631.46	2631.45	2631.71	0.042078	4.06	58.64	115.79	1.01
WASH215	WASH215	2222.05	100-Yr	238.00	2626.61	2627.76	2627.76	2628.12	0.023405	4.80	49.57	71.20	1.01
WASH303	WASH303	853.2	100-Yr	118.00	2759.98	2760.81	2760.82	2761.05	0.045991	3.91	30.17	70.25	1.05
WASH303	WASH303	720.12	100-Yr	118.00	2753.78	2754.31	2754.35	2754.53	0.052193	3.74	31.55	108.74	1.22
WASH303	WASH303	549.67	100-Yr	118.00	2744.99	2745.52	2745.60	2745.83	0.049788	4.46	26.47	74.76	1.32
WASH303	WASH303	355.78	100-Yr	118.00	2734.84	2735.67	2735.71	2735.97	0.045847	4.40	26.85	56.93	1.13
WASH303	WASH303	269.71	100-Yr	118.00	2730.88	2731.92	2732.04	2732.24	0.041195	4.59	25.73	56.90	1.20
WASH303	WASH303	132.89	100-Yr	118.00	2724.93	2726.11	2726.14	2726.36	0.044630	4.05	30.46	81.95	1.03
WASH304	WASH304	1155.27	100-Yr	128.00	2774.36	2775.07	2775.21	2775.55	0.052469	5.57	22.97	57.49	1.55
WASH304	WASH304	1006.91	100-Yr	128.00	2767.95	2768.61	2768.65	2768.86	0.038451	3.99	32.10	89.74	1.18
WASH304	WASH304	850.13	100-Yr	128.00	2760.03	2760.80	2760.84	2761.05	0.067057	4.04	31.70	92.33	1.21
WASH304	WASH304	691.11	100-Yr	128.00	2752.99	2753.67	2753.67	2753.90	0.033449	3.91	32.71	68.82	1.00
WASH304	WASH304	502.99	100-Yr	128.00	2743.19	2744.11	2744.38	2745.02	0.070426	7.65	16.74	35.21	1.96
WASH304	WASH304	424.79	100-Yr	128.00	2739.93	2740.90	2740.99	2741.33	0.031728	5.28	24.25	43.77	1.25
WASH304	WASH304	296	100-Yr	128.00	2733.40	2734.22	2734.44	2734.97	0.085885	6.95	18.41	52.10	2.06
WASH304	WASH304	121.66	100-Yr	128.00	2724.83	2726.09	2726.18	2726.54	0.030441	5.37	23.84	42.02	1.26
WASH305	WASH305	2547.49	100-Yr	283.00	2718.18	2719.55	2719.78	2720.31	0.067375	7.02	40.33	73.00	1.66
WASH305	WASH305	2420.26	100-Yr	283.00	2713.00	2714.49	2714.58	2715.06	0.038778	6.08	46.52	130.04	1.43
WASH305	WASH305	2276.72	100-Yr	283.00	2706.00	2708.12	2708.17	2708.45	0.054075	4.63	61.07	146.42	1.26
WASH305	WASH305	2156.91	100-Yr	283.00	2701.65	2702.81	2702.83	2703.06	0.045504	4.00	70.67	152.06	1.04
WASH305	WASH305	2008.5	100-Yr	283.00	2695.85	2696.55	2696.65	2696.97	0.042503	5.20	54.40	114.91	1.33
WASH305	WASH305	1881.62	100-Yr	283.00	2689.97	2690.86	2690.92	2691.24	0.047936	4.97	56.94	105.99	1.20
WASH305	WASH305	1803.71	100-Yr	283.00	2686.00	2686.89	2687.00	2687.30	0.053537	5.09	55.55	165.34	1.55
WASH305	WASH305	1661.16	100-Yr	283.00	2678.98	2680.20	2680.34	2680.72	0.040115	5.77	49.01	101.90	1.47
WASH305	WASH305	1316.04	100-Yr	283.00	2663.00	2665.72	2665.80	2666.24	0.043917	5.76	49.11	158.08	1.27
WASH305	WASH305	878.28	100-Yr	337.00	2646.96	2648.03	2648.18	2648.66	0.037323	6.32	53.30	77.17	1.34
WASH305	WASH305	784.34	100-Yr	337.00	2642.58	2643.89	2644.14	2644.61	0.049992	6.79	49.61	69.22	1.41
WASH305	WASH305	647.38	100-Yr	337.00	2636.91	2638.74	2638.74	2638.86	0.006855	2.83	119.00	166.87	0.59
WASH305	WASH305	452.08	100-Yr	337.00	2628.98	2629.73	2630.27	2634.06	0.612498	16.71	20.17	45.65	4.43
WASH305	WASH305	276.42	100-Yr	337.00	2621.75	2622.72	2622.72	2623.02	0.032546	4.42	76.26	127.09	1.01
WASH305	WASH305	109.09	100-Yr	337.00	2614.00	2615.49	2615.59	2615.97	0.056253	5.54	60.78	110.52	1.32
WASH310	WASH310	3156.63	100-Yr	59.00	2765.24	2765.99	2766.11	2766.32	0.055657	4.62	12.76	38.96	1.42
WASH310	WASH310	3066.28	100-Yr	59.00	2760.00	2760.78	2760.89	2761.20	0.057500	5.23	11.28	24.08	1.35
WASH310	WASH310	2892.1	100-Yr	59.00	2750.98	2751.83	2751.87	2752.14	0.046998	4.43	13.31	28.59	1.15
WASH310	WASH310	2659.62	100-Yr	59.00	2740.74	2741.76	2741.79	2742.10	0.039763	4.65	12.69	21.20	1.06
WASH310	WASH310	2458.9	100-Yr	97.00	2731.84	2733.08	2733.20	2733.67	0.043209	6.19	15.66	19.27	1.21
WASH310	WASH310	2317.03	100-Yr	97.00	2725.98	2727.62	2727.64	2728.10	0.035453	5.56	17.46	19.49	1.03
WASH310	WASH310	2190.27	100-Yr	97.00	2720.21	2721.82	2722.12	2722.70	0.051327	7.50	12.93	14.04	1.38
WASH310	WASH310	2072	100-Yr	97.00	2715.25	2717.08	2717.19	2717.49	0.036373	5.11	19.00	57.62	1.57
WASH310	WASH310	1948.44	100-Yr	97.00	2709.92	2711.02	2711.22	2711.72	0.061138	6.73	14.41	20.47	1.41
WASH310	WASH310	1796.97	100-Yr	105.00	2702.93	2704.43	2704.43	2704.73	0.036878	4.44	23.63	39.41	1.01
WASH310	WASH310	1653.76	100-Yr	105.00	2696.05	2697.50	2697.73	2698.38	0.053297	7.51	13.98	13.89	1.32
WASH310	WASH310	1548.34	100-Yr	105.00	2691.74	2692.95	2693.06	2693.54	0.038684	6.15	17.07	20.27	1.18
WASH310	WASH310	1415.8	100-Yr	105.00	2686.48	2687.24	2687.35	2687.65	0.050604	5.17	20.31	52.46	1.46
WASH310	WASH310	1202.35	100-Yr	156.00	2677.94	2678.93	2679.07	2679.47	0.032364	5.88	26.55	43.10	1.32
WASH310	WASH310	1052.07	100-Yr	156.00	2672.00	2673.21	2673.37	2673.82	0.044255	6.27	24.89	36.42	1.34
WASH310	WASH310	918.02	100-Yr	156.00	2665.95	2667.25	2667.40	2667.93	0.043497	6.60	23.65	27.41	1.25
WASH310	WASH310	835.22	100-Yr	156.00	2662.63	2664.18	2664.21	2664.65	0.034975	5.46	28.59	35.10	1.07
WASH310	WASH310	673.3	100-Yr	156.00	2656.56	2657.66	2657.89	2658.46	0.041428	7.15	21.82	30.36	1.49
WASH310	WASH310	522.83	100-Yr	156.00	2650.43	2651.43	2651.56	2651.95	0.044073	5.73	27.22	47.66	1.34
WASH310	WASH310	369.06	100-Yr	156.00	2643.65	2644.69	2644.85	2645.32	0.041962	6.37	24.48	37.19	1.38
WASH310	WASH310	170.27	100-Yr	156.00	2634.99	2635.79	2635.91	2636.33	0.048532	5.93	26.33	41.92	1.32
WASH310	WASH310	67.28	100-Yr	156.00	2630.08	2631.50	2631.51	2631.79	0.038841	4.32	36.10	64.46	1.02
WASH335	WASH335	1845.55	100-Yr	79.00	2719.99	2721.96	2722.29	2723.15	0.067222	8.74	9.04	7.00	1.36
WASH335	WASH335	1767.51	100-Yr	79.00	2716.90	2719.13	2719.13	2719.84	0.033835	6.76	11.69	8.33	1.01
WASH335	WASH335	1616.42	100-Yr	79.00	2710.94	2712.72	2712.92	2713.55	0.052195	7.29	10.84	10.38	1.26
WASH335	WASH335	1467.16	100-Yr	79.00	2704.99	2706.86	2707.09	2707.75	0.029962	7.58	10.42	9.84	1.30
WASH335	WASH335	1328.24	100-Yr	79.00	2699.00	2700.40	2700.73	2701.49	0.074807	8.38	9.43	11.14	1.61
WASH335	WASH335	1084.9	100-Yr	79.00	2687.99	2689.72	2689.72	2690.26	0.032995	5.89	13.42	12.72	1.01
WASH335	WASH335	907.49	100-Yr	79.00	2678.92	2680.35	2680.76	2681.66	0.077001	9.17	8.61	8.36	1.59
WASH335	WASH335	712.92	100-Yr	79.00	2670.98	2672.72	2672.75	2673.32	0.026170	6.22	12.70	11.41	1.04
WASH335	WASH335	630.49	100-Yr	79.00	2666.90	2668.24	2668.66	2669.54	0.095080	9.15	8.64	9.87	1.72
WASH335	WASH335	480.5	100-Yr	79.00	2660.75	2661.85	2661.89	2662.25	0.027778	5.09	15.52	22.45	1.08
WASH335	WASH335	186.85	100-Yr	79.00	2648.85	2649.33	2649.45	2649.74	0.073386	5.13	15.41	47.54	1.59
WASH335	WASH335	45.45	100-Yr	79.00	2643.00	2643.96	2644.03	2644.30	0.023472	4.67	16.92	32.44	1.14
WASH340	WASH340	961.19	100-Yr	59.00	2685.99	2688.19	2688.19	2688.49	0.043912	4.42	13.34	23.76	1.04
WASH340	WASH340	742.14	100-Yr	59.00	2676.95	2678.20	2678.51	2679.24	0.040037	8.16	7.23	7.83	1.50
WASH340	WASH340	590.9	100-Yr	59.00	2669.97	2671.68	2671.89	2672.67	0.047117	7.97	7.41	5.76	1.24
WASH340	WASH340	374.63	100-Yr	59.00	2662.80	2663.79	2663.93	2664.37	0.030971	6.15	9.59	14.01	1.31
WASH340	WASH340	134.72	100-Yr	59.00	2652.84	2653.86	2653.90	2654.38	0.058741	5.77	10.22	41.40	1.31
WASH340	WASH340	2.81	100-Yr	59.00	2646.97	2647.99	2648.10	2648.40	0.035713	5.15	11.45	27.85	1.42

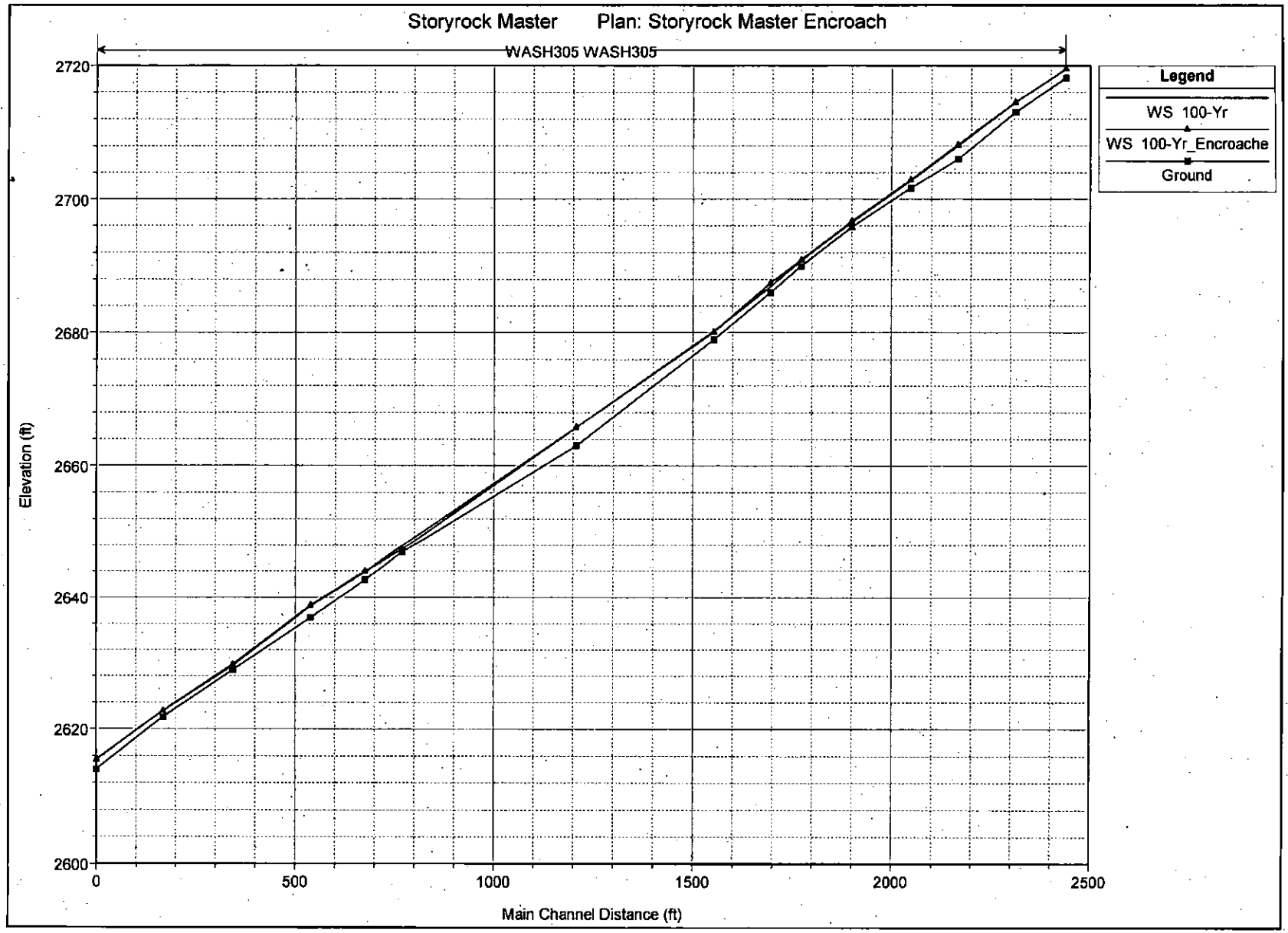
O SITE BOUNDARY CROSS SECTION

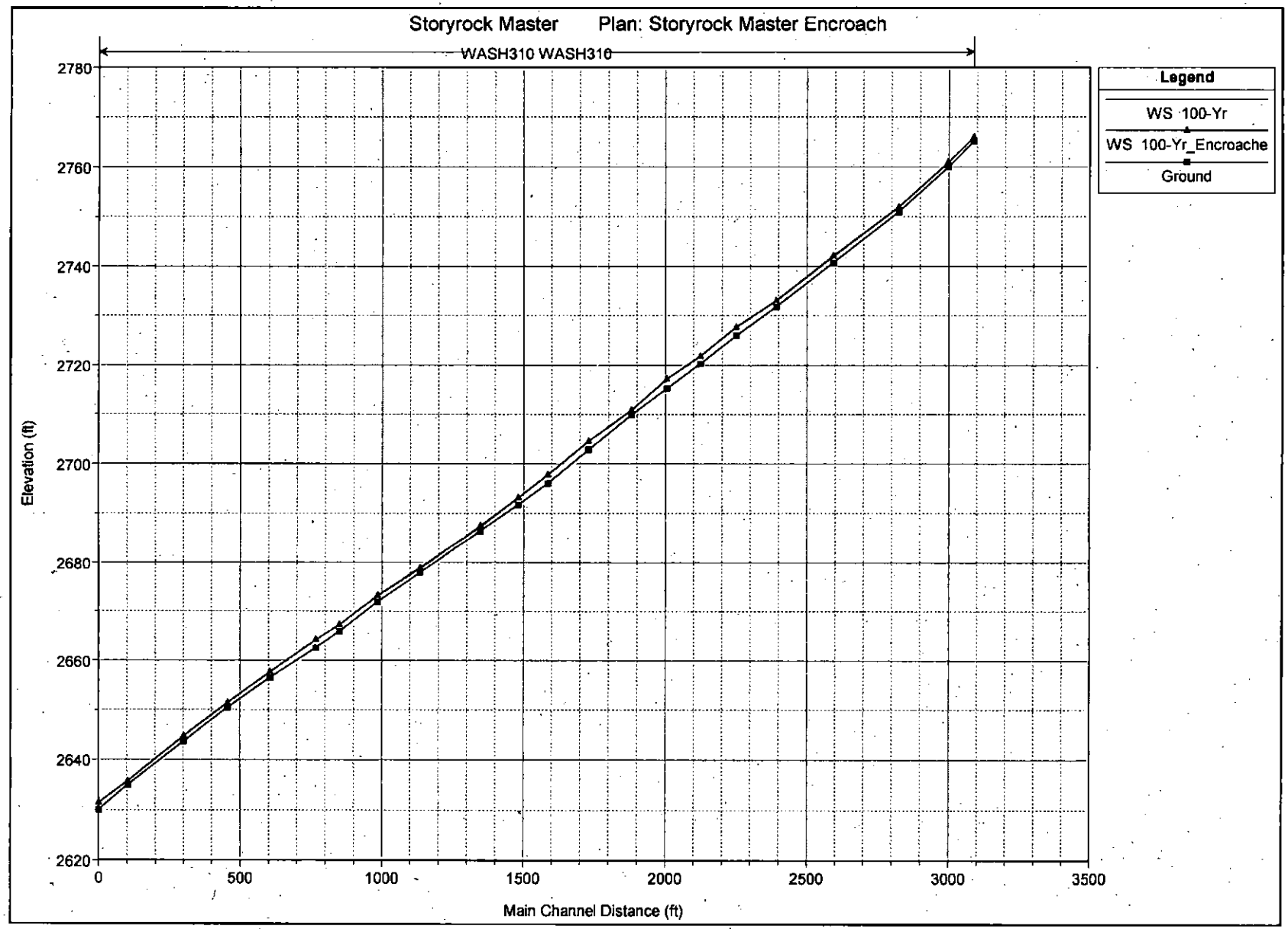
HEC-RAS Proposed Condition

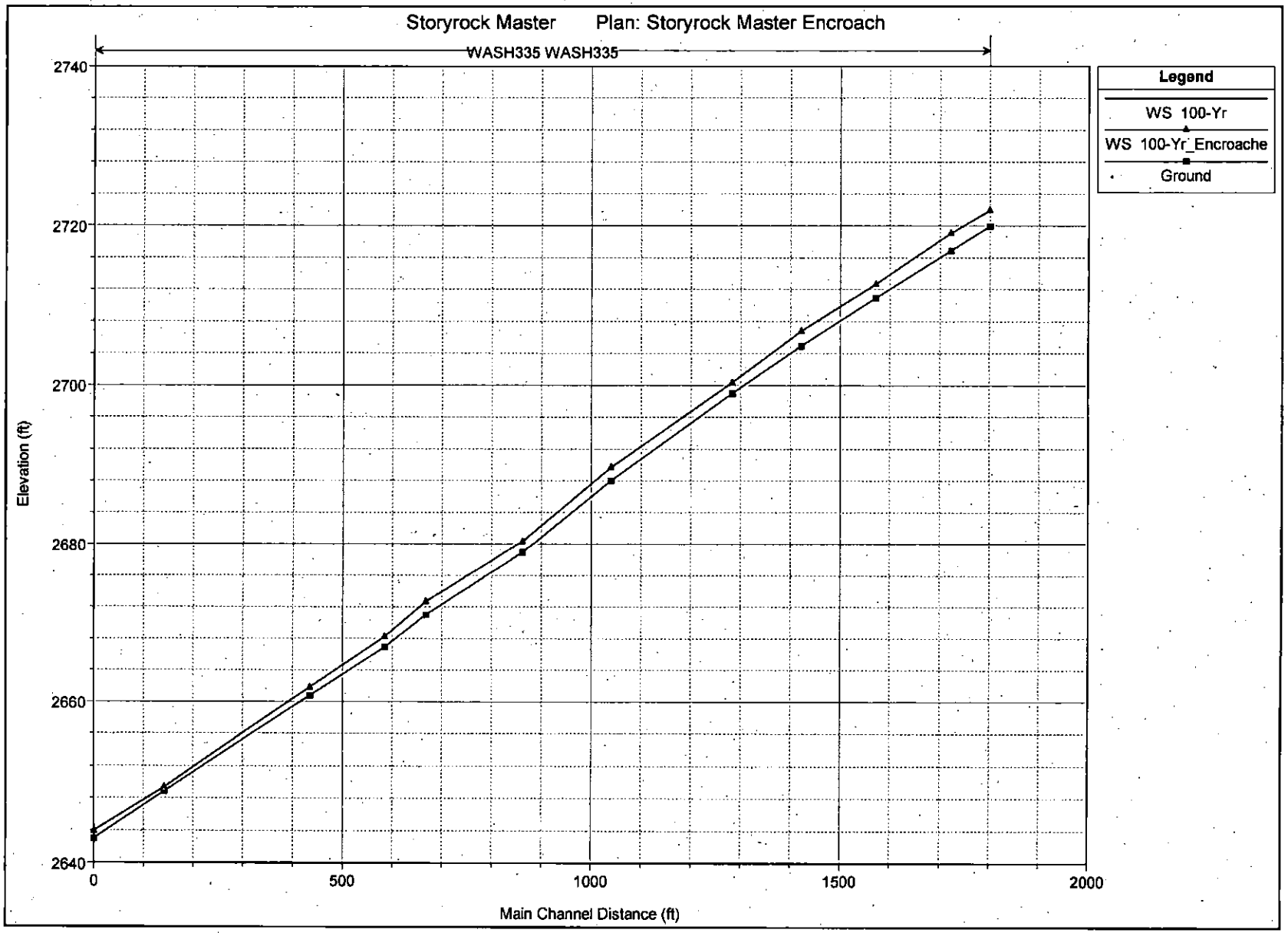

Storyrock Master Plan: Storyrock Master Encroach
WASH215 WASH215
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Elevation (ft)
2700
2680
2660
2640
2620
2600
2580
2560
2540
0
500
1000
1500
2000
2500
3000
3500
4000
Main Channel Distance (ft)

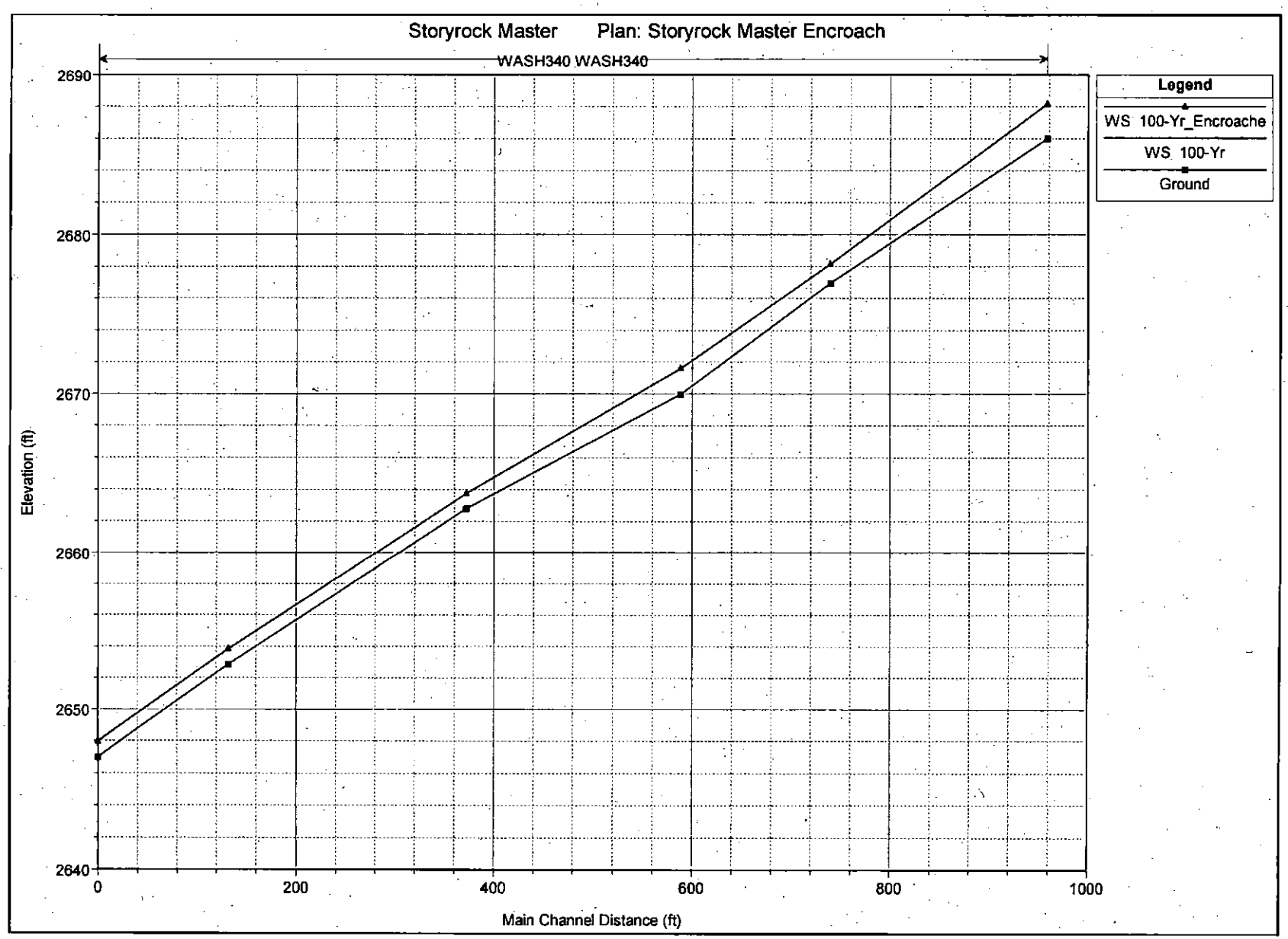

Storyrock Master Plan: Storyrock Master Encroach
WASH303 WASH303
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Elevation (ft)
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
0
100
200
300
400
500
600
700
800
Main Channel Distance (ft)

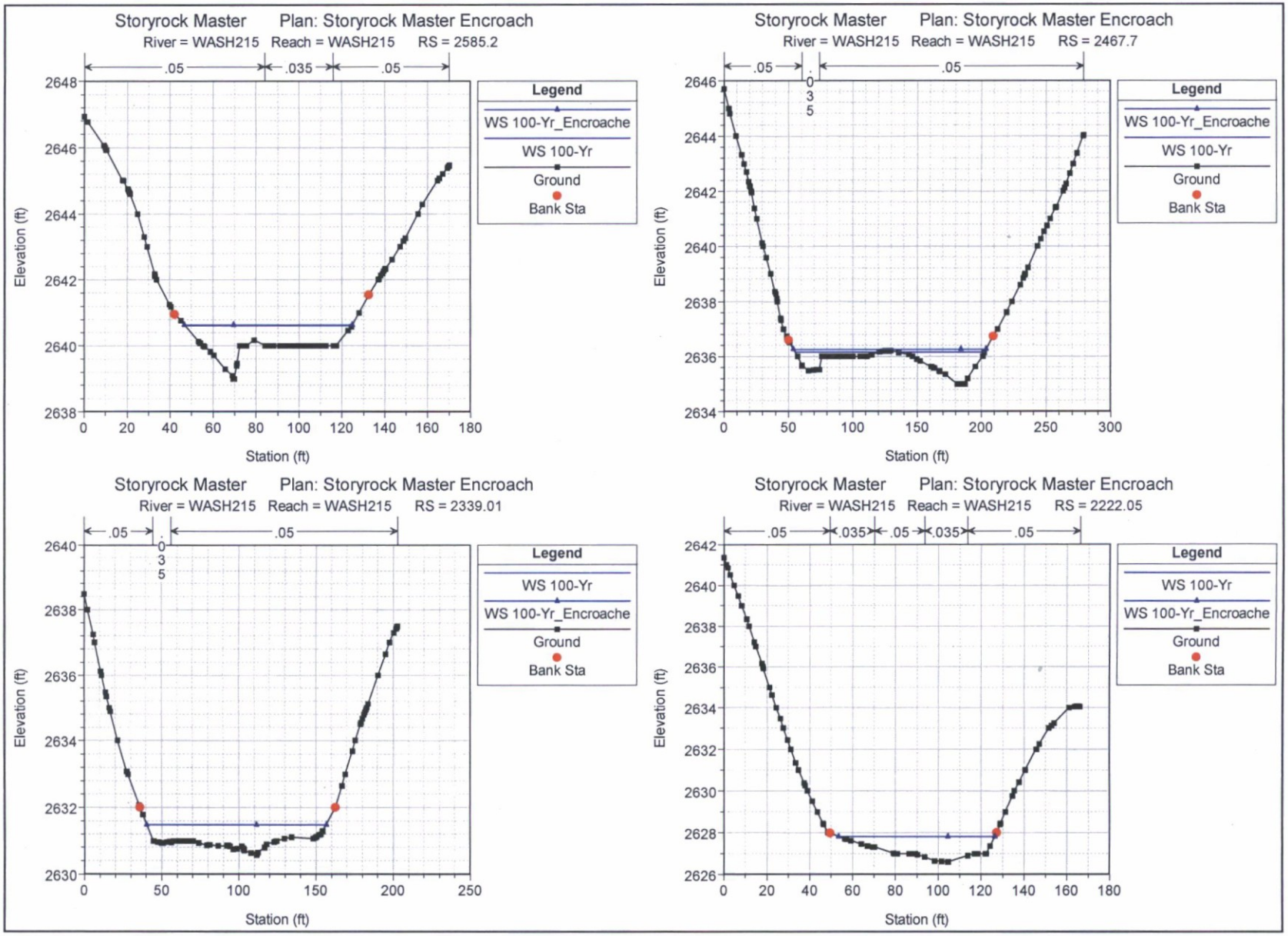

Storyrock Master Plan: Storyrock Master Encroach
WASH304 WASH304
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Elevation (ft)
2780
2770
2760
2750
2740
2730
2720
0
200
400
600
800
1000
1200
Main Channel Distance (ft)

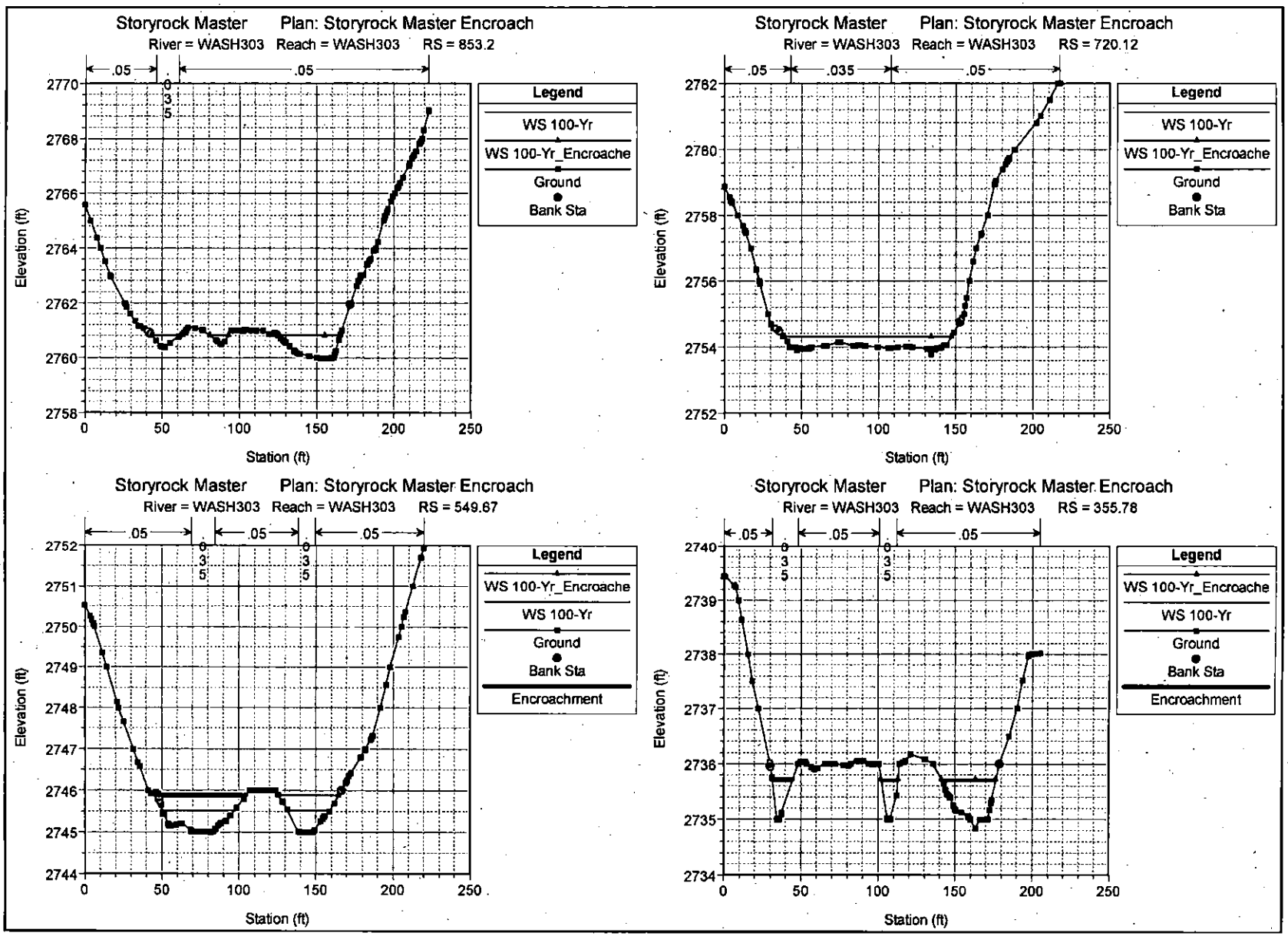

Storyrock Master Plan: Storyrock Master Encroach
WASH305 WASH305
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Elevation (ft)
2720
2700
2680
2660
2640
2620
2600
0
500
1000
1500
2000
2500
Main Channel Distance (ft)

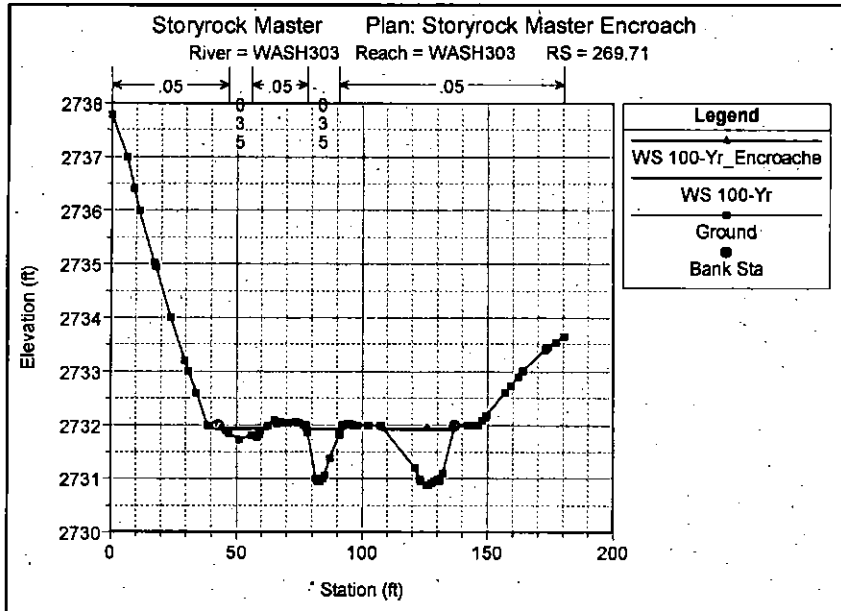

Storyrock Master Plan: Storyrock Master Encroach
WASH310 WASH310
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Elevation (ft)
2780
2760
2740
2720
2700
2680
2660
2640
2620
0
500
1000
1500
2000
2500
3000
3500
Main Channel Distance (ft)

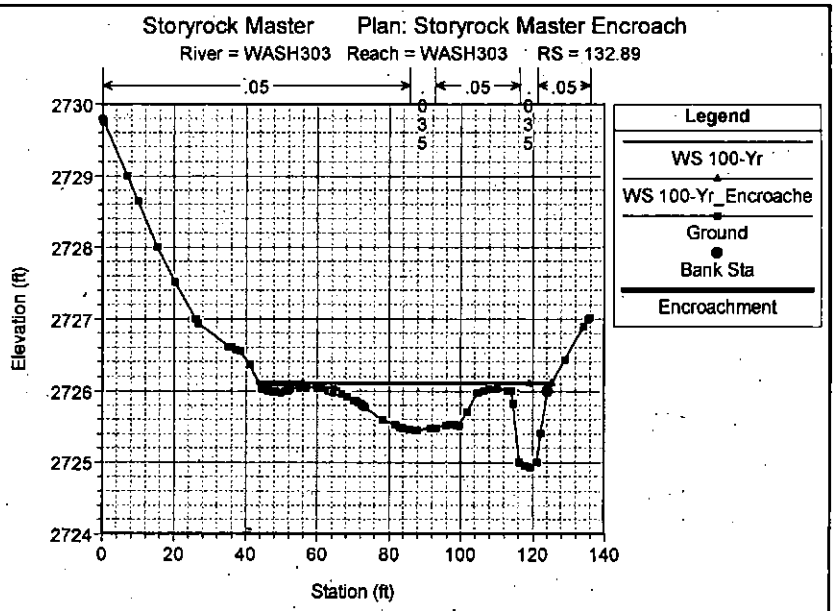

Storyrock Master Plan: Storyrock Master Encroach
WASH335 WASH335
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Elevation (ft)
2740
2720
2700
2680
2660
2640
0
500
1000
1500
2000
Main Channel Distance (ft)

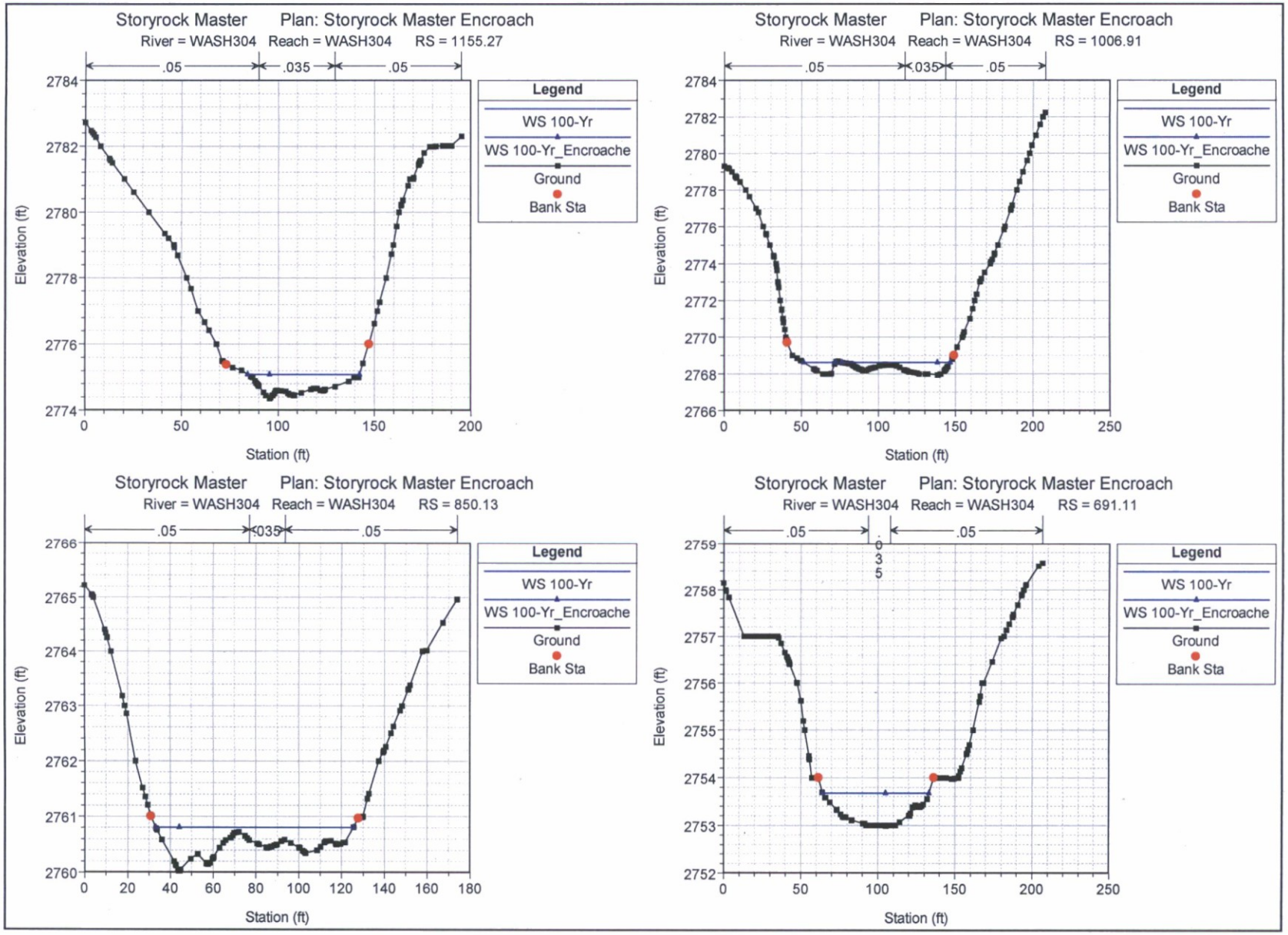

Storyrock Master Plan: Storyrock Master Encroach
WASH340 WASH340
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Elevation (ft)
2690
2680
2670
2660
2650
2640
0
200
400
600
800
1000
Main Channel Distance (ft)

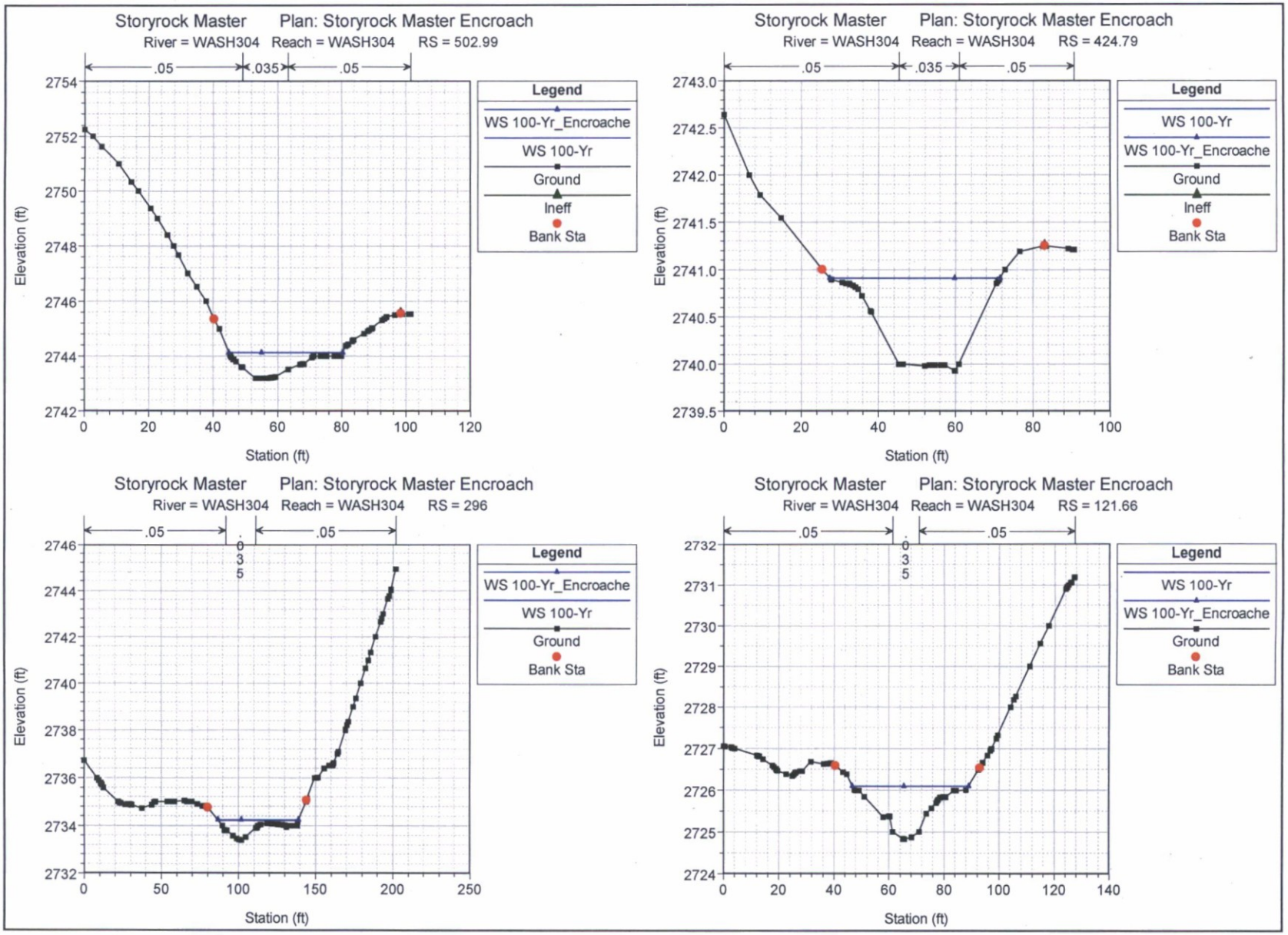

Storyrock Master Plan: Storyrock Master Encroach
River = WASH215 Reach = WASH215 RS = 2585.2
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH215 Reach = WASH215 RS = 2467.7
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH215 Reach = WASH215 RS = 2339.01
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH215 Reach = WASH215 RS = 2222.05
.05
.035
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta

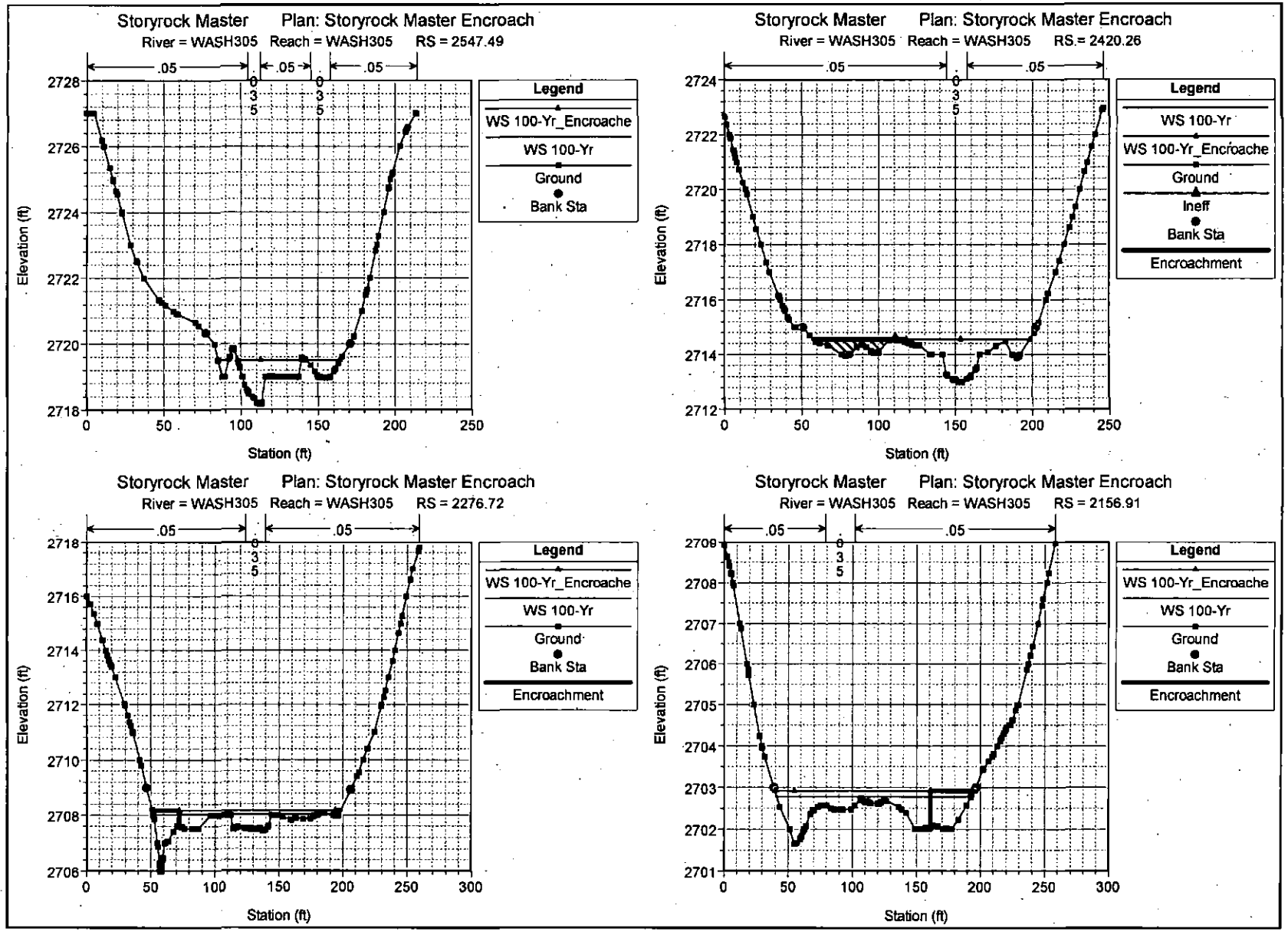

Storyrock Master Plan: Storyrock Master Encroach
River = WASH303 Reach = WASH303 RS = 853.2
.05
.05
0
3
5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH303 Reach = WASH303 RS = 720.12
.05
.035
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH303 Reach = WASH303 RS = 549.67
.05
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH303 Reach = WASH303 RS = 355.78
.05
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

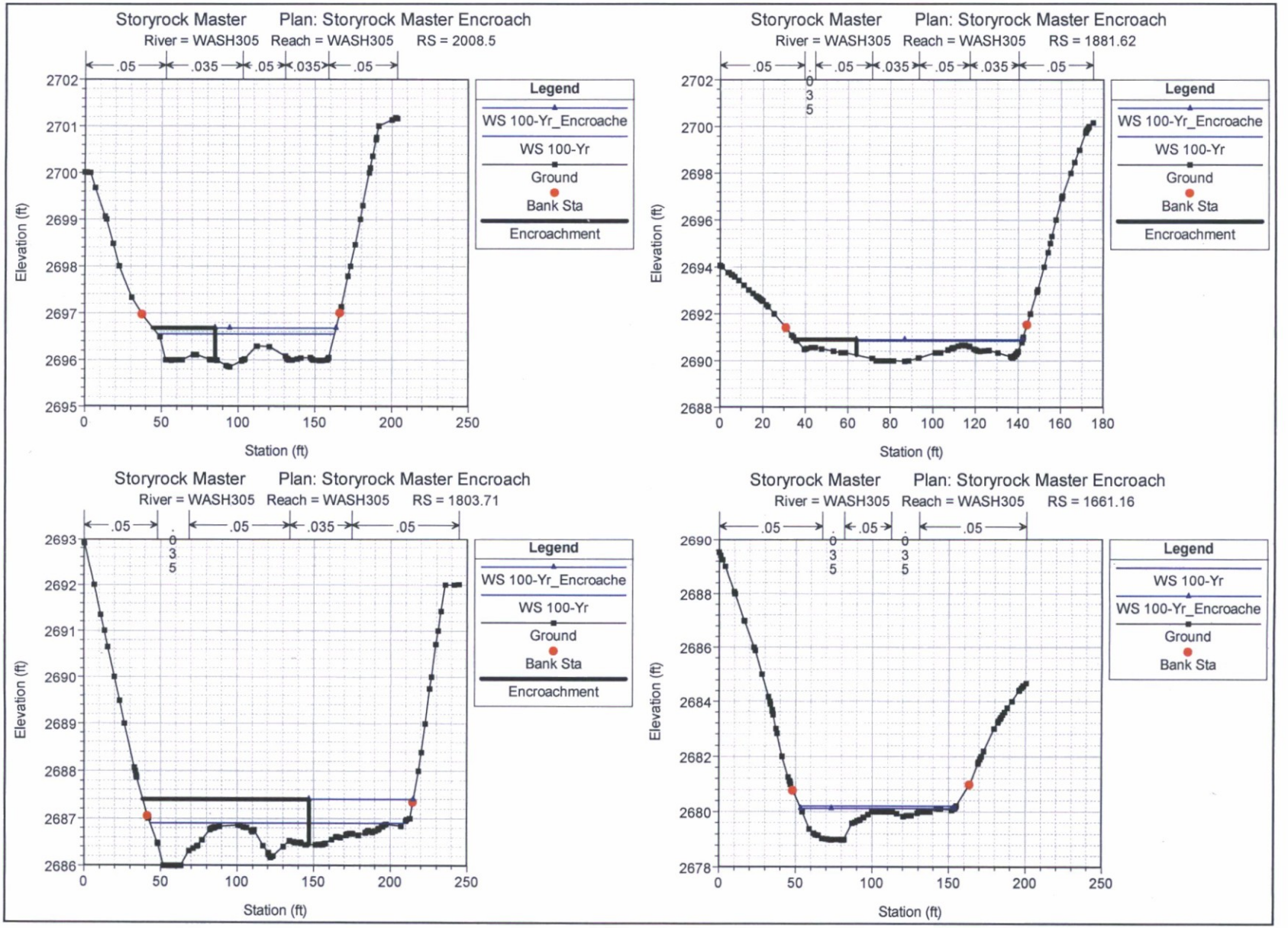

Storyrock Master Plan: Storyrock Master Encroach
River = WASH303 Reach = WASH303 RS = 269.71
.05
.05
.05
0.035
0.035
Elevation (ft)
2738
2737
2736
2735
2734
2733
2732
2731
2730
0
50
100
150
200
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta

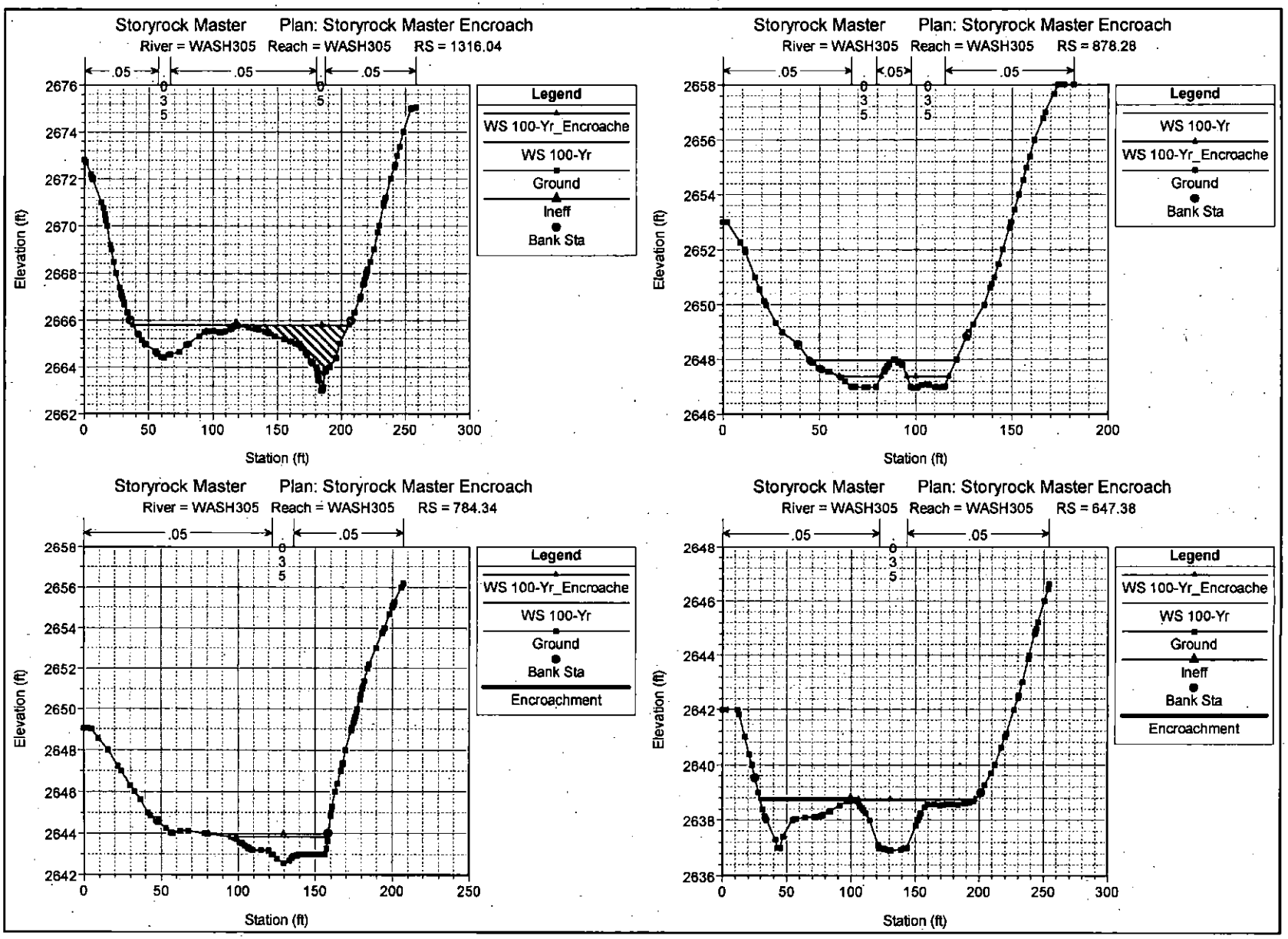

Storyrock Master Plan: Storyrock Master Encroach
River = WASH303 Reach = WASH303 RS = 132.89
.05
.05
.05
0.035
0.035
Elevation (ft)
2730
2729
2728
2727
2726
2725
2724
0
20
40
60
80
100
120
140
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Encroachment

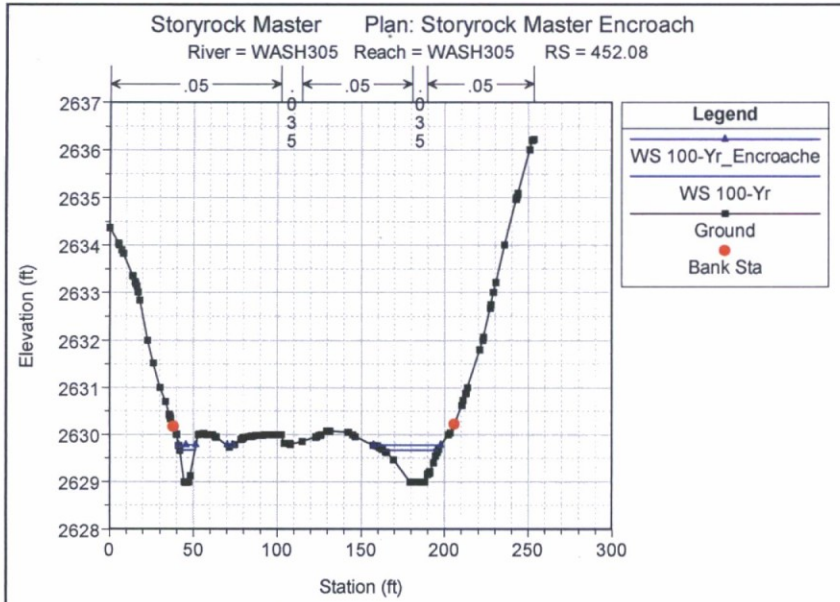

Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 1155.27
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 1006.91
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 850.13
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 691.11
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta

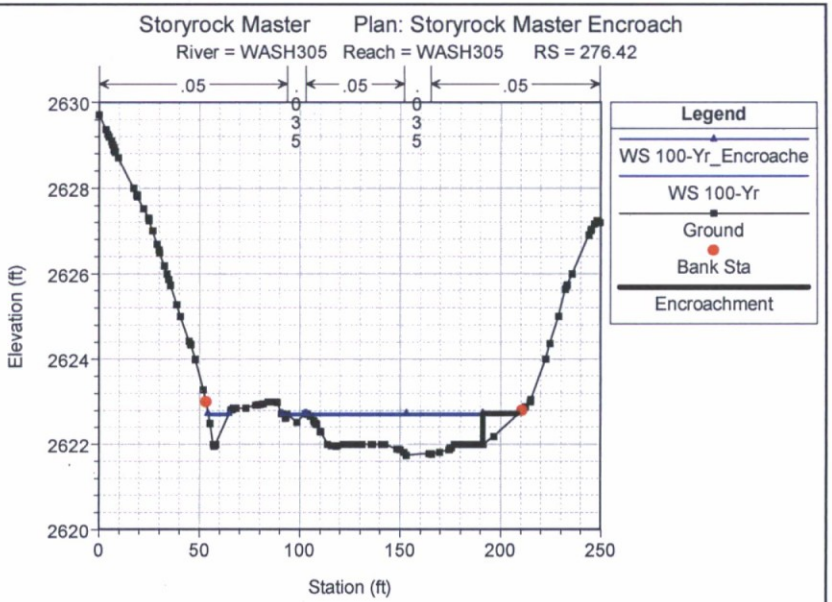

Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 502.99
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Ineff
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 424.79
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Ineff
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 296
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH304 Reach = WASH304 RS = 121.66
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta

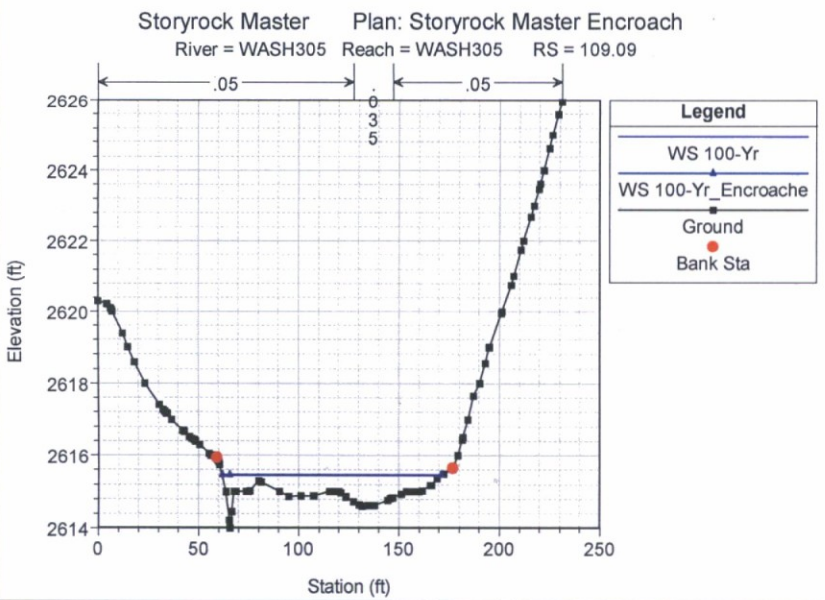

Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 2547.49
.05
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS.= 2420.26
.05
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 2276.72
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 2156.91
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

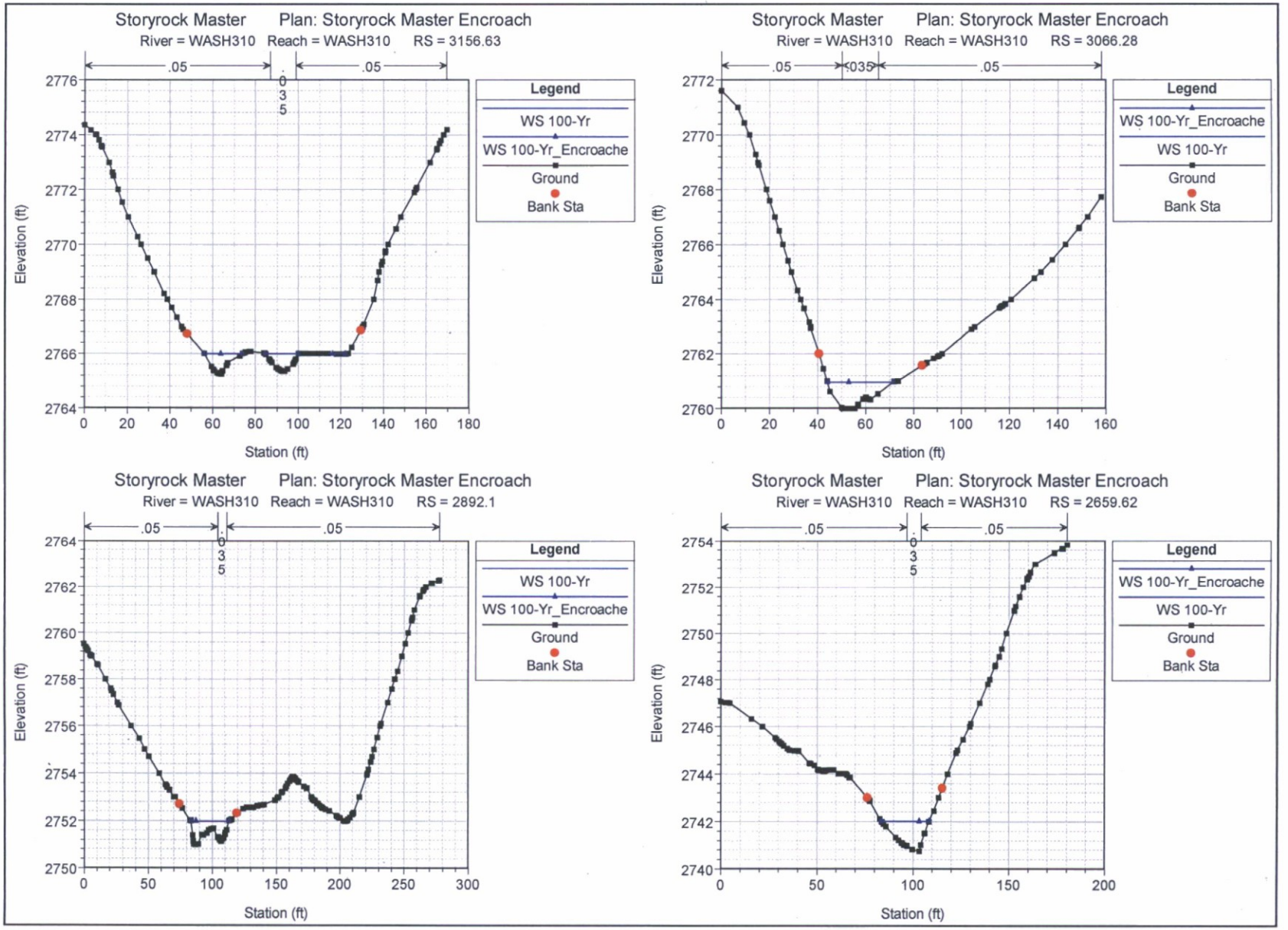

Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 2008.5
.05 .035 .05 .035 .05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 1881.62
.05 .05 .035 .05 .035 .05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 1803.71
.05 .05 .035 .05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 1661.16
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta

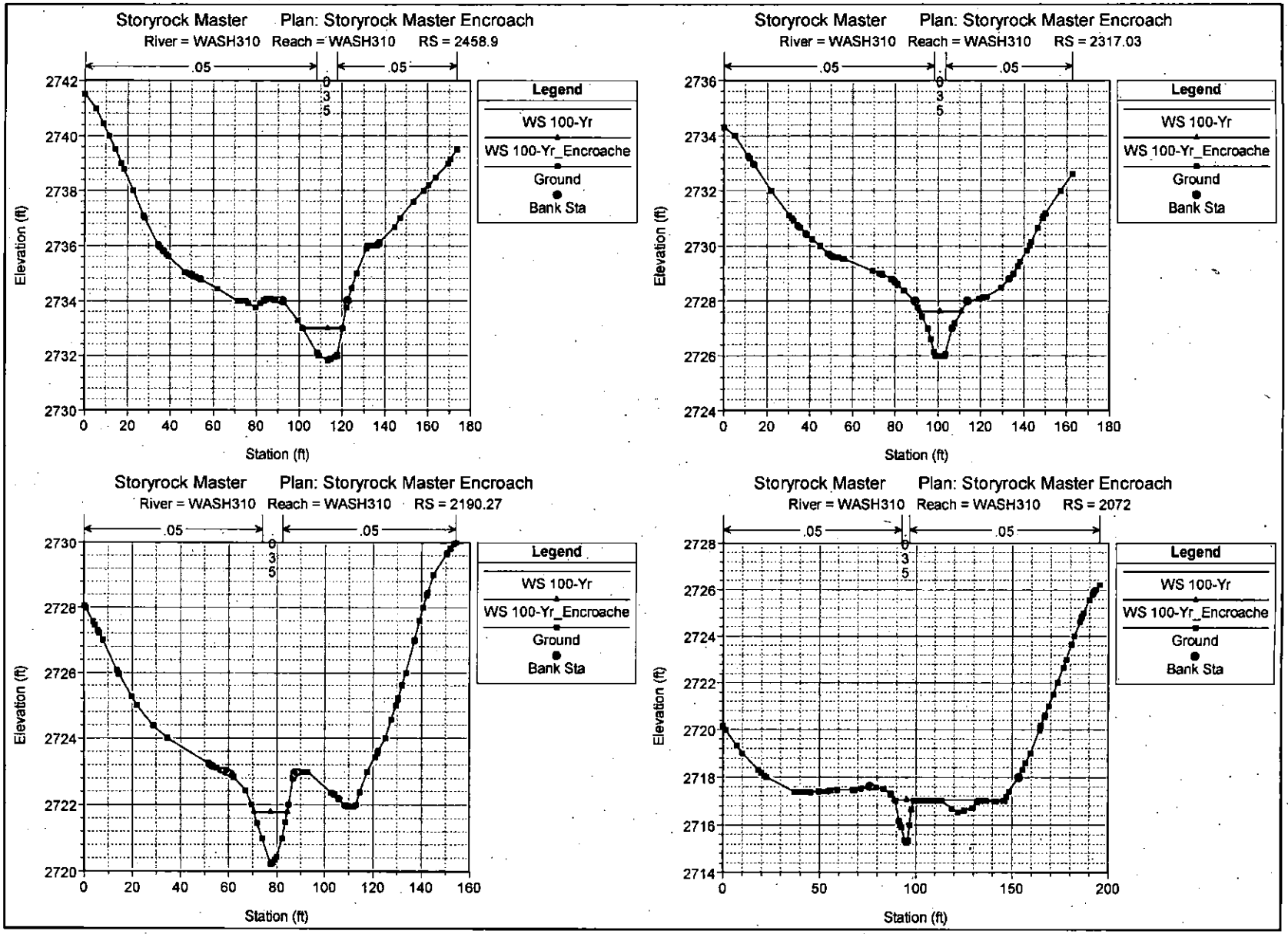

Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 1316.04
.05
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 878.28
.05
.05
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 784.34
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 647.38
.05
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

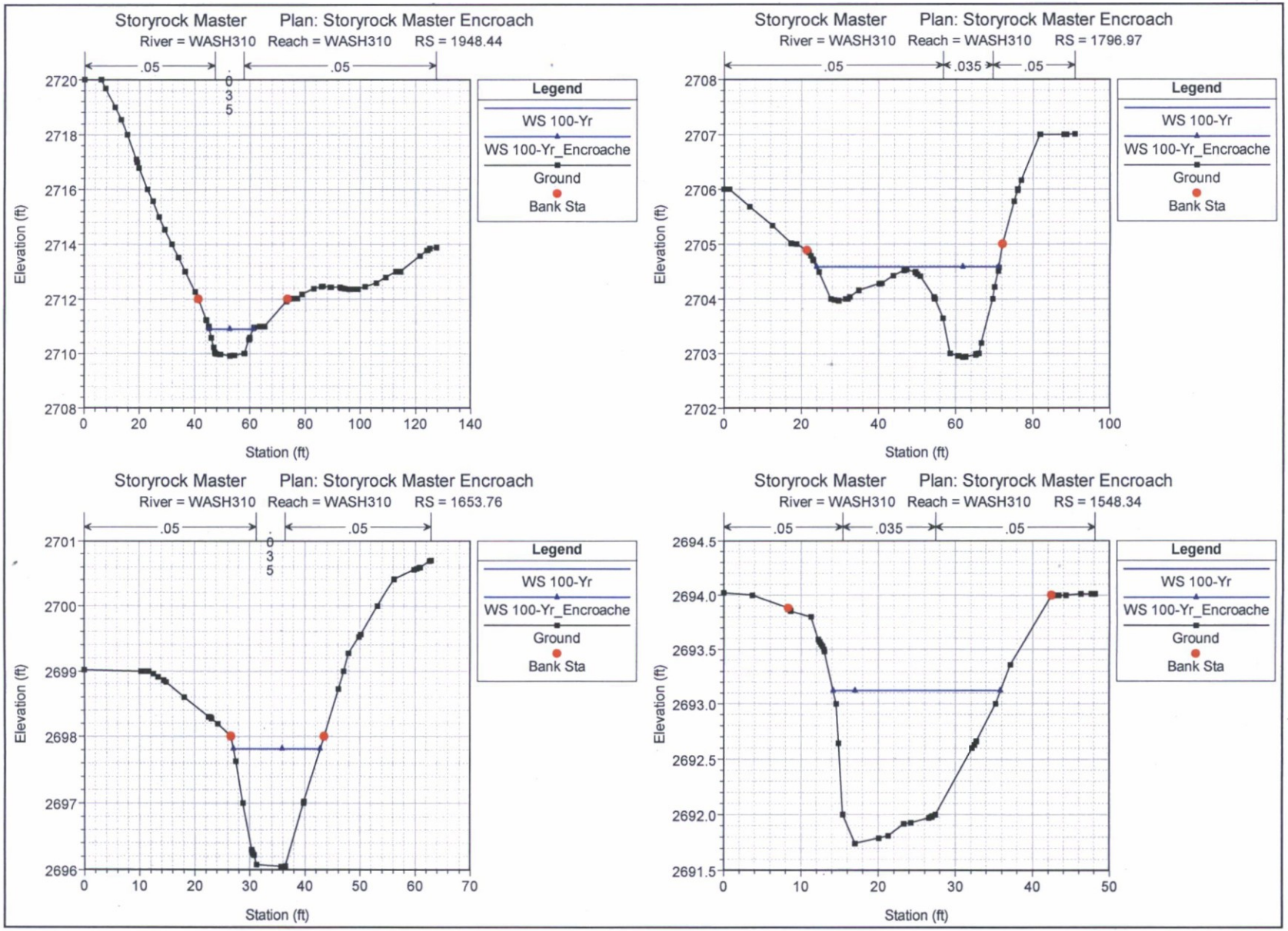

Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 452.08
.05
.035
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta

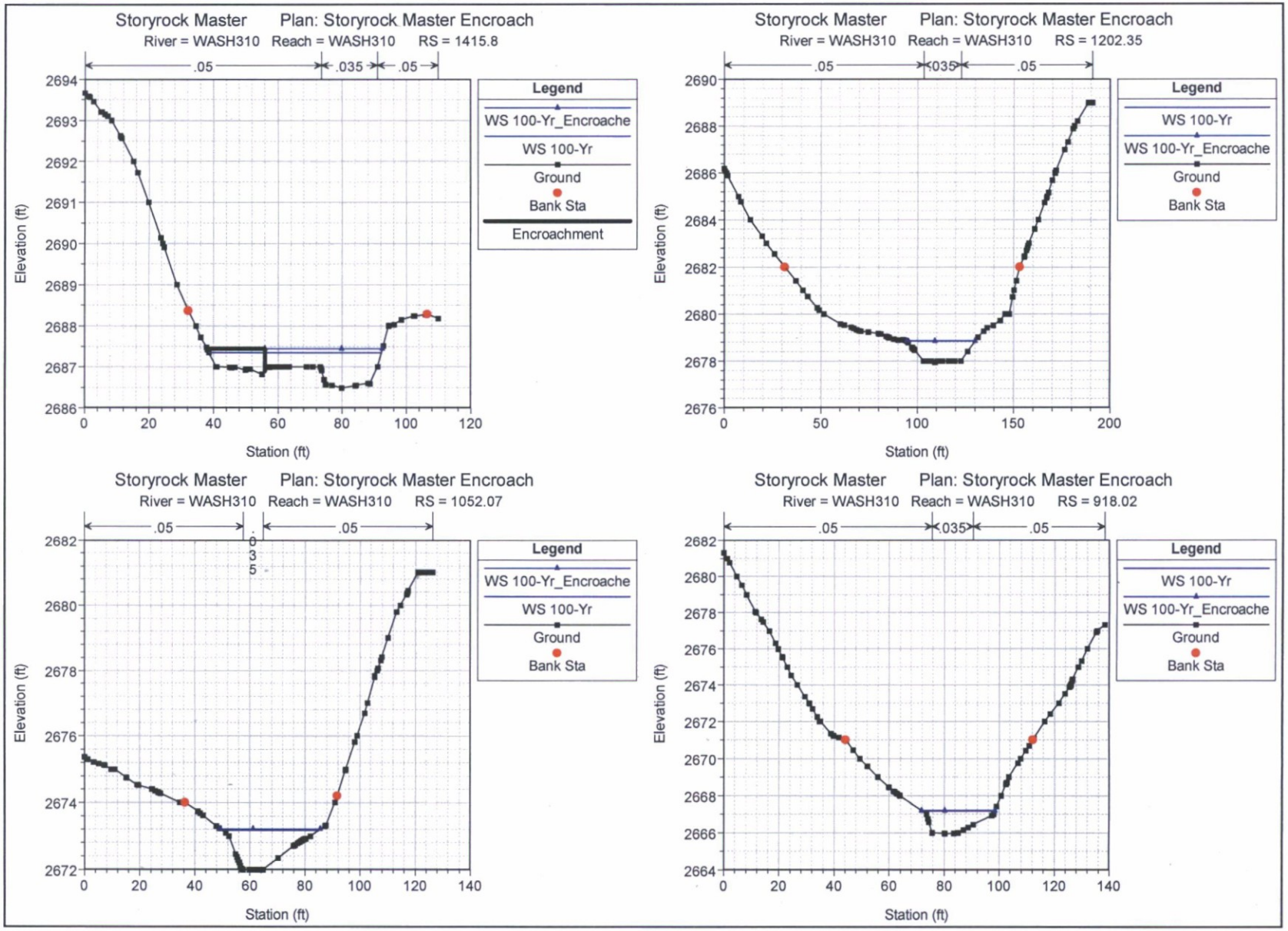

Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 276.42
.05
.035
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment


Storyrock Master Plan: Storyrock Master Encroach
River = WASH305 Reach = WASH305 RS = 109.09
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta


Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 3156.63
.05
.035
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 3066.28
.05
.035
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 2892.1
.05
.035
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 2659.62
.05
.035
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 2458.9
.05
.05
0
3
5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 2317.03
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 2190.27
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 2072


Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 1948.44
.05
.035
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 1796.97
.05
.035
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 1653.76
.05
.035
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 1548.34
.05
.035
.05
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 1415.8
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 1202.35
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 1052.07
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 918.02
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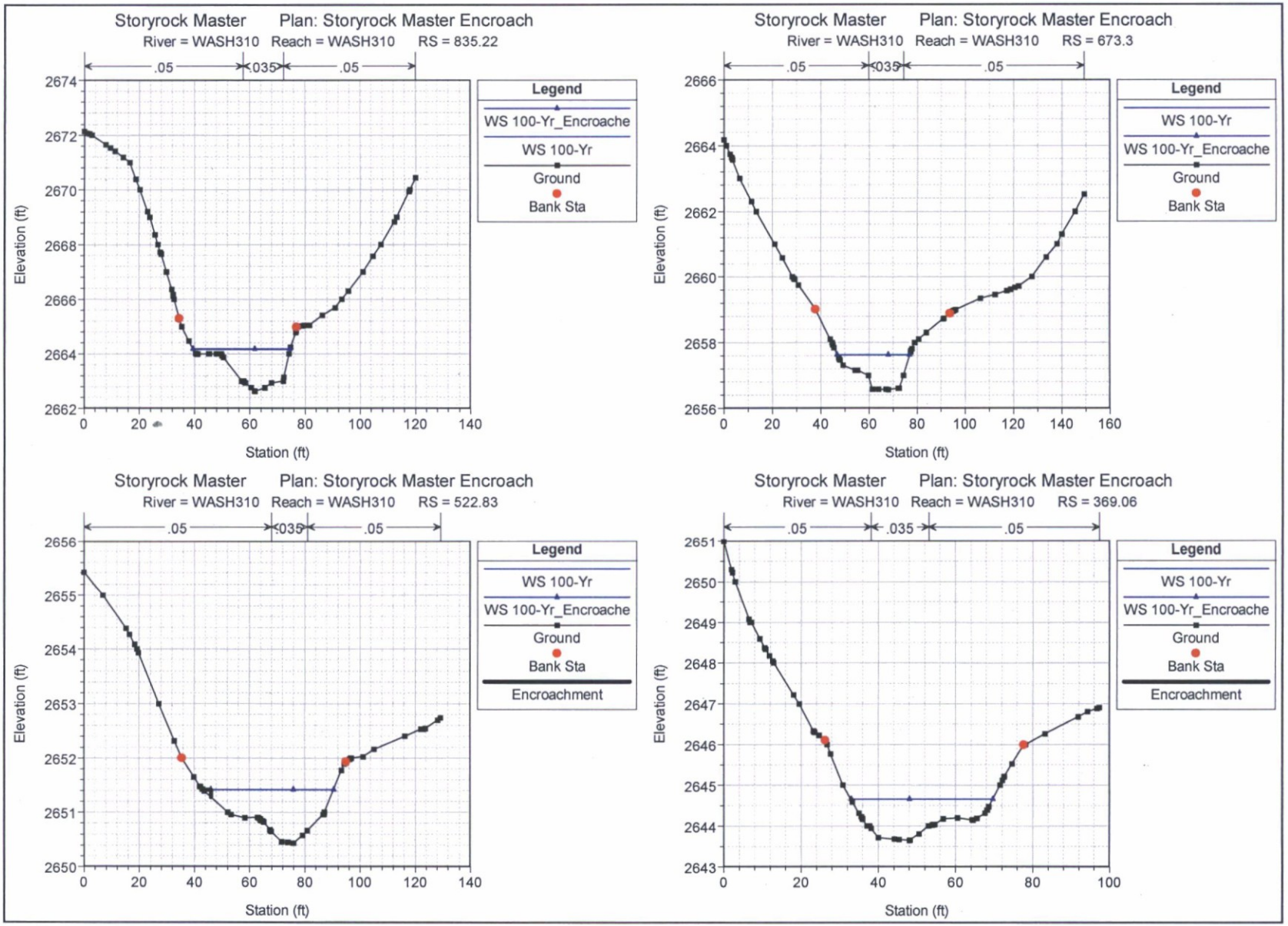
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 673.3
.05
.035
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Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 522.83
.05
.035
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Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Encroachment
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 369.06
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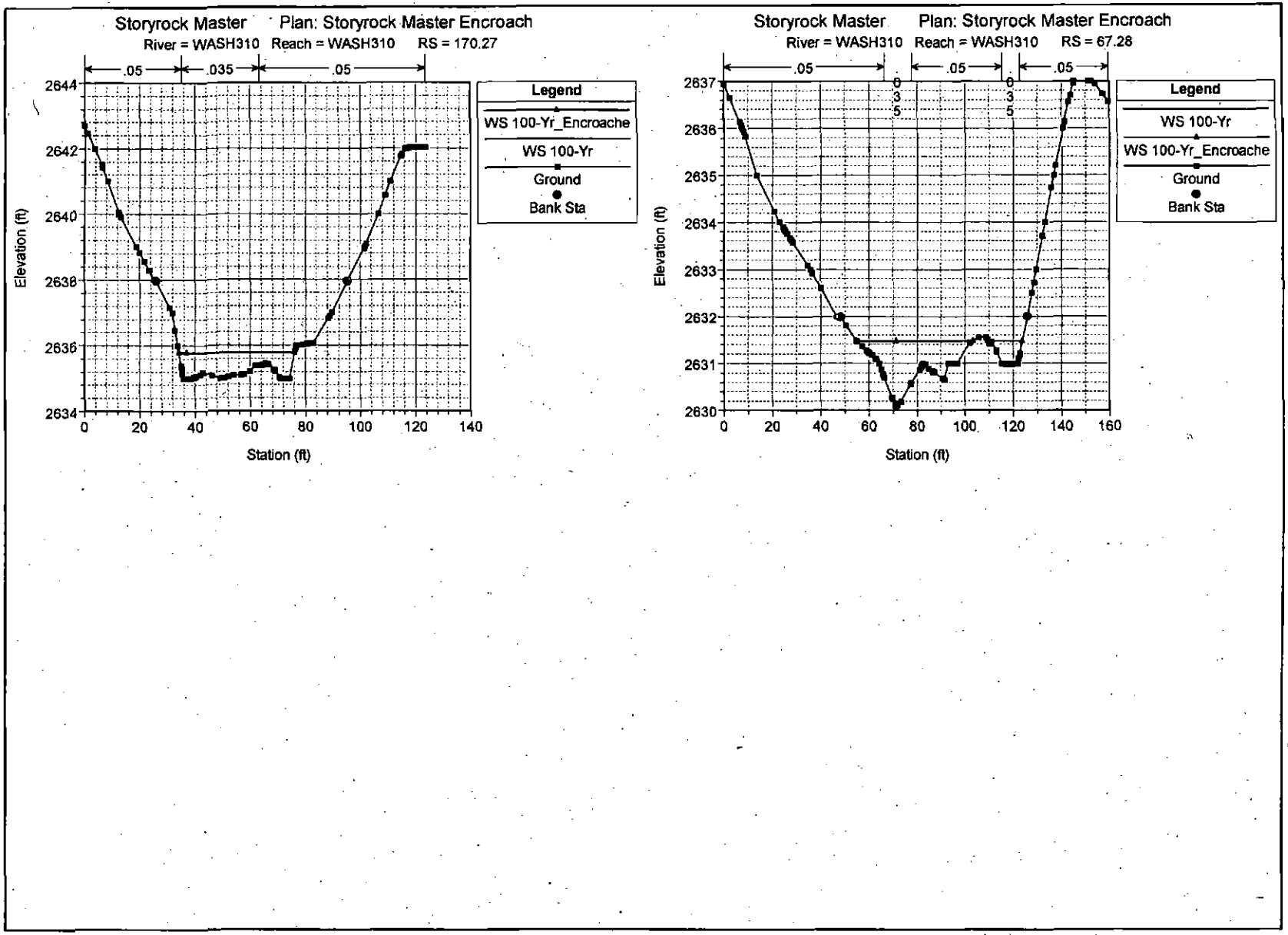
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Encroachment


Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 170.27
.05
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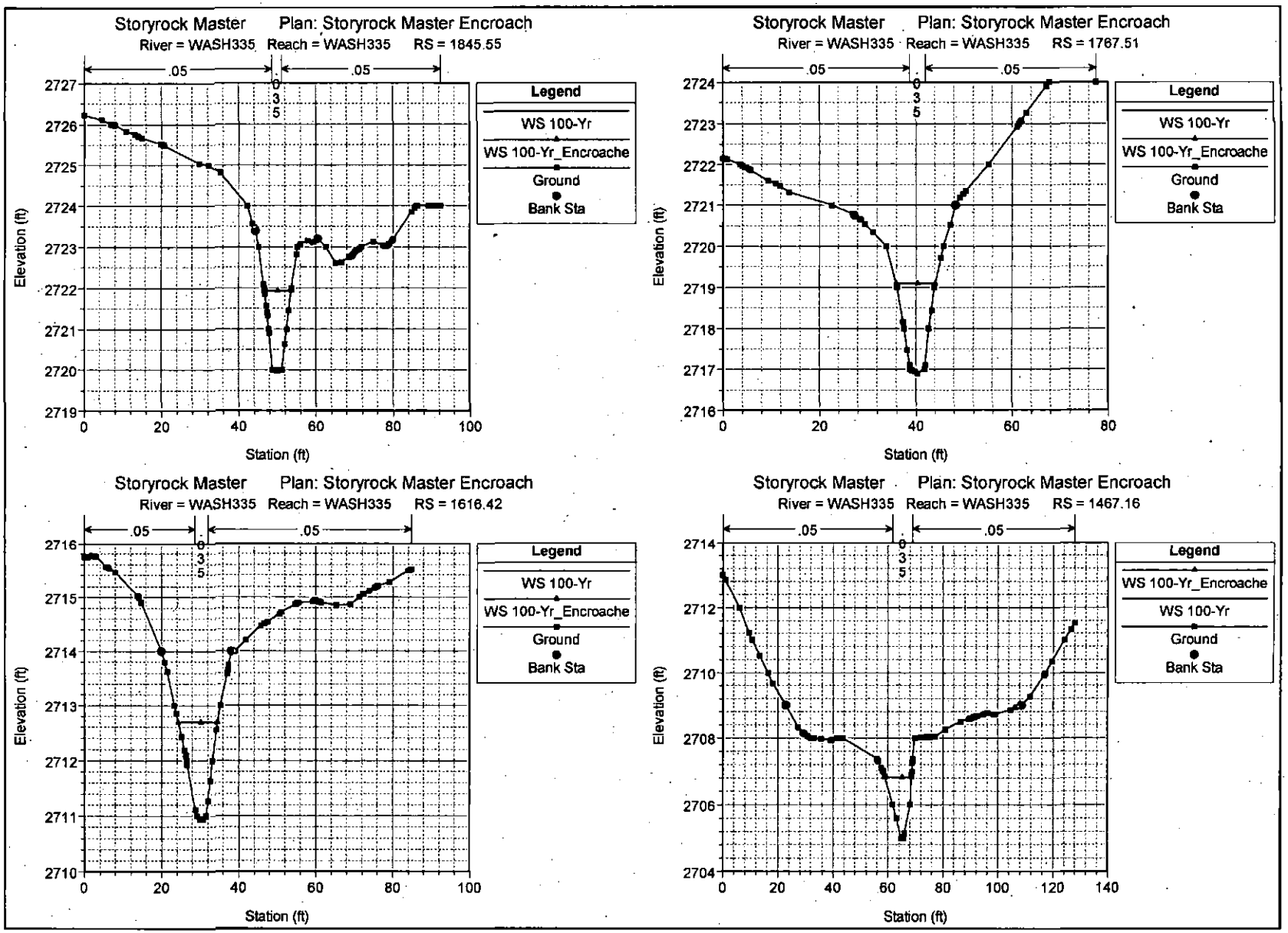
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH310 Reach = WASH310 RS = 67.28
.05
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta


Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 1845.55
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5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 1767.51
Storyrock Master Plan: Storyrock Master Encroach
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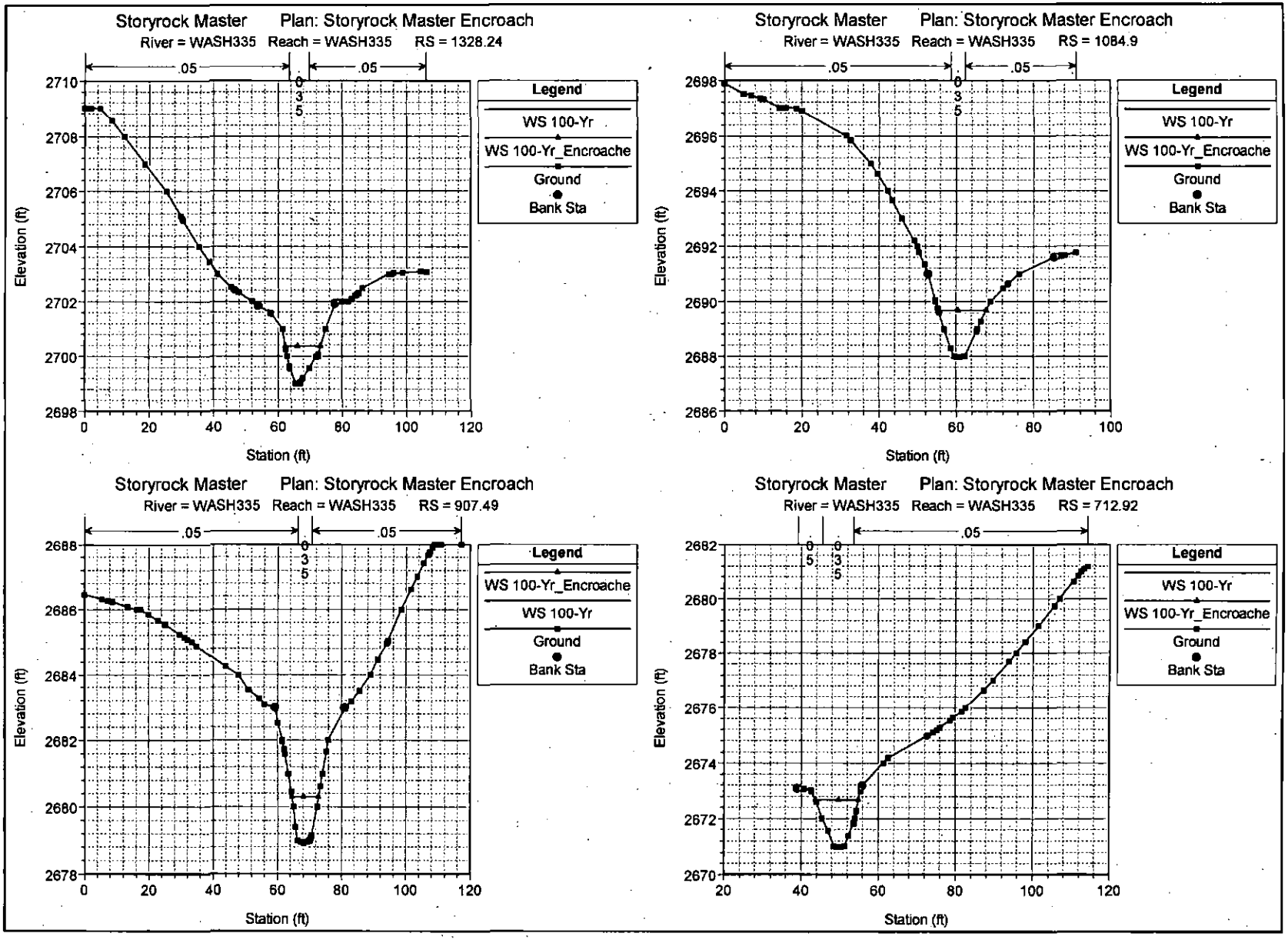
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 1467.16


Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 1328.24
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.05
0
3
5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 1084.9
.05
.05
0
3
5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 907.49
.05
.05
0
3
5
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 712.92
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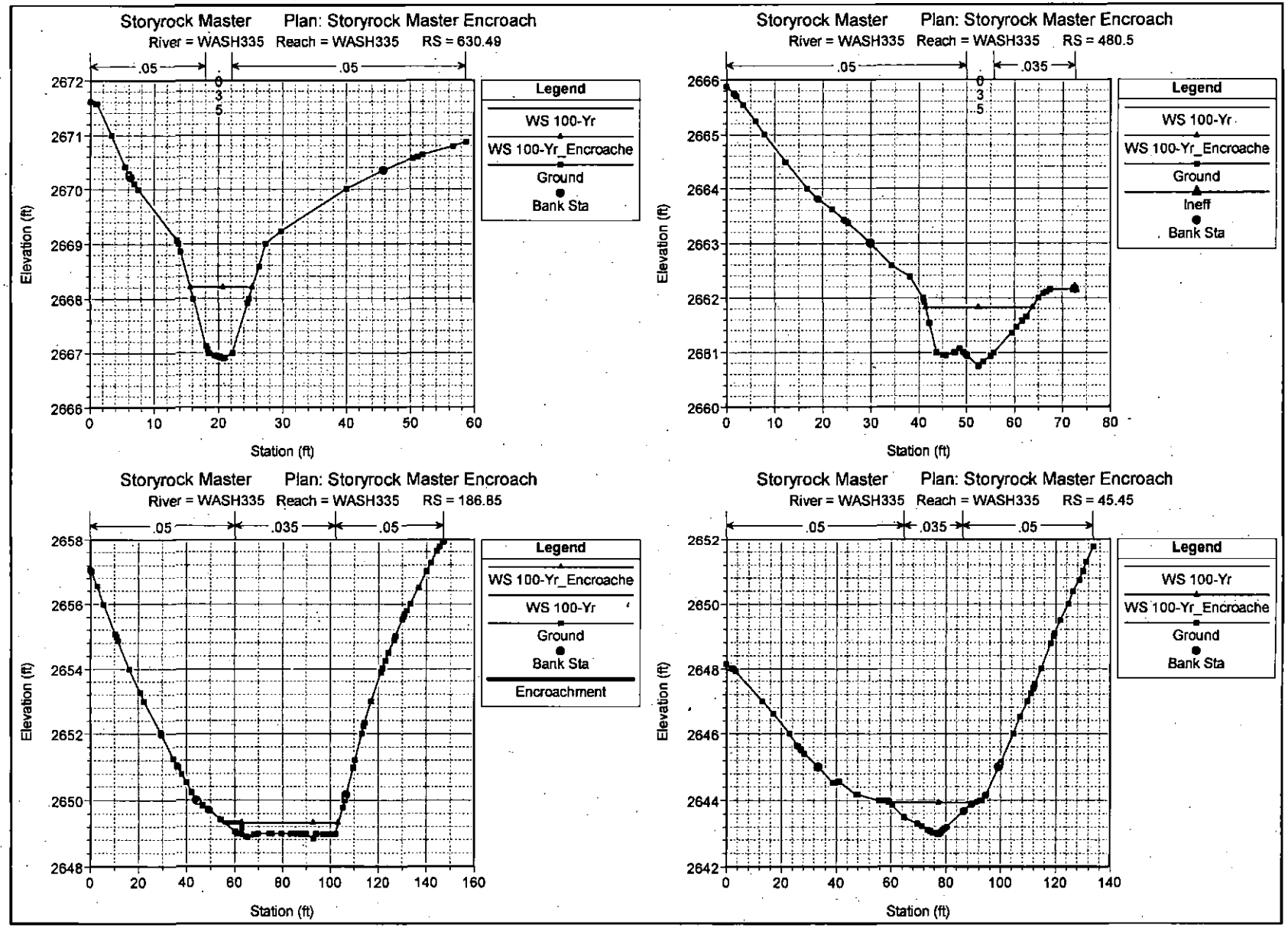
0
5
0
3
5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 630.49
.05
.05
0
3
5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 480.5
.05
.035
0
3
5
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 186.85
.05
.035
.05
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Storyrock Master Plan: Storyrock Master Encroach
River = WASH335 Reach = WASH335 RS = 45.45
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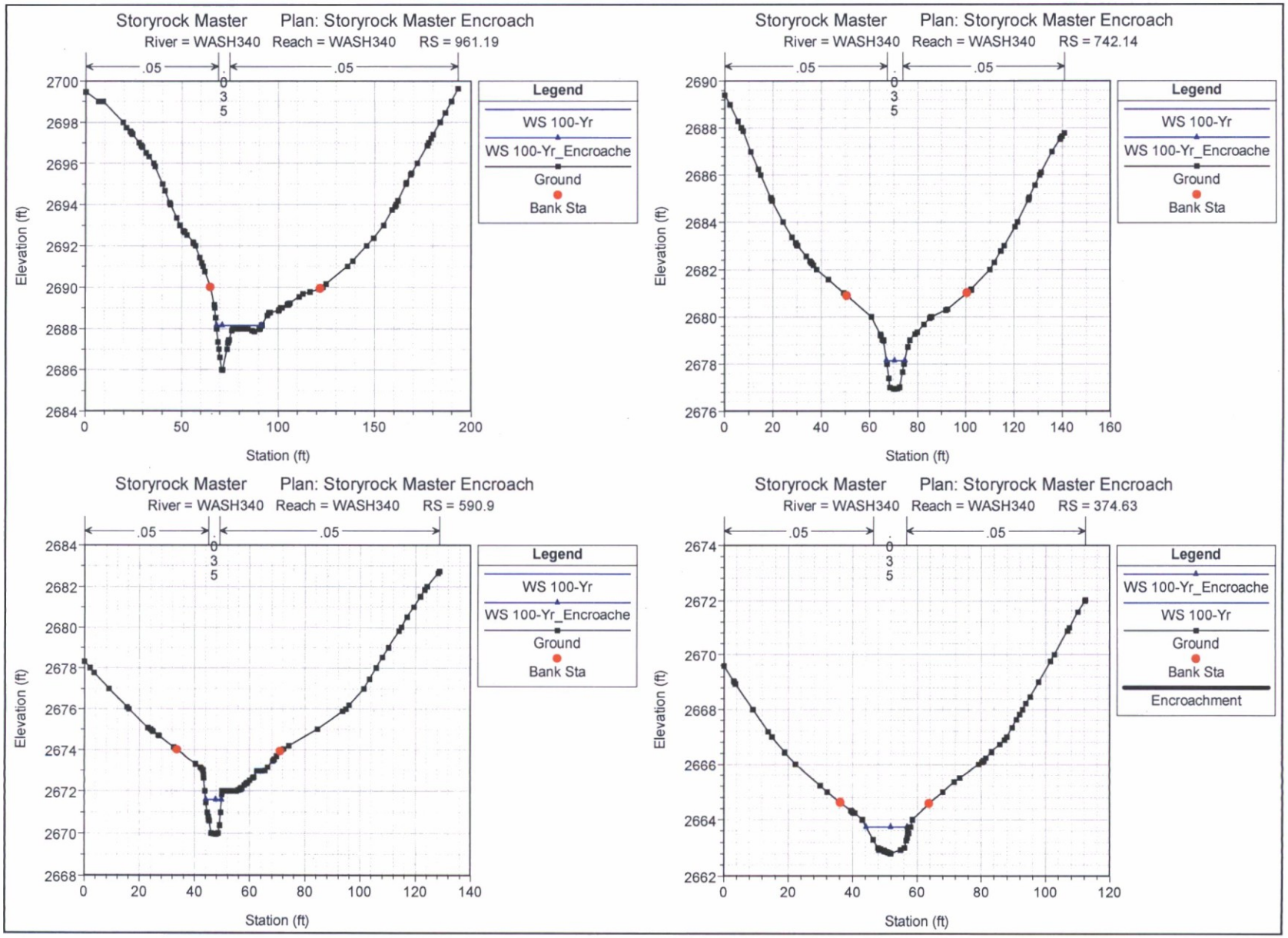
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Elevation (ft)
Station (ft)


Storyrock Master Plan: Storyrock Master Encroach
River = WASH340 Reach = WASH340 RS = 961.19
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.035
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Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH340 Reach = WASH340 RS = 742.14
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH340 Reach = WASH340 RS = 590.9
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr
WS 100-Yr_Encroache
Ground
Bank Sta
Storyrock Master Plan: Storyrock Master Encroach
River = WASH340 Reach = WASH340 RS = 374.63
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS 100-Yr_Encroache
WS 100-Yr
Ground
Bank Sta
Encroachment

HEC-RAS Plan: Encroach Locations: User Defined

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
WASH215	WASH215	2585.2	100-Yr	251.00	2638.99	2640.62	2640.67	2641.00	0.035573	4.96	50.61	77.74	1.08
WASH215	WASH215	2585.2	100-Yr_Encroache	251.00	2638.99	2640.63	2640.67	2641.00	0.033231	4.85	51.74	78.05	1.05
WASH215	WASH215	2467.7	100-Yr	251.00	2635.00	2636.16	2636.23	2636.48	0.062163	4.56	55.09	132.71	1.25
WASH215	WASH215	2467.7	100-Yr_Encroache	251.00	2635.00	2636.27	2636.23	2636.47	0.031396	3.52	71.25	149.99	0.90
WASH215	WASH215	2339.01	100-Yr	264.00	2630.58	2631.49	2631.49	2631.77	0.042529	4.24	62.33	116.44	1.02
WASH215	WASH215	2339.01	100-Yr_Encroache	264.00	2630.58	2631.49	2631.49	2631.77	0.042529	4.24	62.33	116.44	1.02
WASH215	WASH215	2222.05	100-Yr	264.00	2626.61	2627.81	2627.81	2628.19	0.023062	4.92	53.61	72.84	1.01
WASH215	WASH215	2222.05	100-Yr_Encroache	264.00	2626.61	2627.81	2627.81	2628.19	0.023062	4.92	53.61	72.84	1.01
WASH303	WASH303	853.2	100-Yr	121.00	2759.98	2760.82	2760.83	2761.06	0.046001	3.93	30.77	71.04	1.05
WASH303	WASH303	853.2	100-Yr_Encroache	121.00	2759.98	2760.82	2760.83	2761.06	0.046001	3.93	30.77	71.04	1.05
WASH303	WASH303	720.12	100-Yr	121.00	2753.78	2754.31	2754.36	2754.54	0.052250	3.78	32.03	108.87	1.23
WASH303	WASH303	720.12	100-Yr_Encroache	121.00	2753.78	2754.31	2754.36	2754.54	0.052250	3.78	32.03	108.87	1.23
WASH303	WASH303	549.67	100-Yr	121.00	2744.99	2745.53	2745.60	2745.84	0.049727	4.49	26.97	75.12	1.32
WASH303	WASH303	549.67	100-Yr_Encroache	121.00	2745.00	2745.89	2746.02	2746.37	0.043789	5.55	21.81	39.28	1.31
WASH303	WASH303	355.78	100-Yr	121.00	2734.84	2735.68	2735.73	2735.99	0.045847	4.43	27.33	57.38	1.13
WASH303	WASH303	355.78	100-Yr_Encroache	121.00	2734.84	2735.72	2735.81	2736.11	0.056617	4.98	24.28	46.15	1.21
WASH303	WASH303	269.71	100-Yr	121.00	2730.88	2731.93	2732.05	2732.26	0.041011	4.60	26.30	57.71	1.20
WASH303	WASH303	269.71	100-Yr_Encroache	121.00	2730.88	2731.95	2732.05	2732.25	0.035995	4.37	27.72	59.66	1.13
WASH303	WASH303	132.89	100-Yr	121.00	2724.93	2726.12	2726.14	2726.37	0.044821	4.09	30.96	82.08	1.04
WASH303	WASH303	132.89	100-Yr_Encroache	121.00	2724.93	2726.10	2726.14	2726.39	0.051769	4.30	28.61	69.39	1.11
WASH304	WASH304	1155.27	100-Yr	132.00	2774.36	2775.08	2775.23	2775.57	0.052399	5.62	23.47	57.77	1.56
WASH304	WASH304	1155.27	100-Yr_Encroache	132.00	2774.36	2775.08	2775.22	2775.57	0.052399	5.62	23.47	57.77	1.56
WASH304	WASH304	1006.91	100-Yr	132.00	2767.95	2768.62	2768.66	2768.87	0.038537	4.02	32.85	90.65	1.18
WASH304	WASH304	1006.91	100-Yr_Encroache	132.00	2767.95	2768.62	2768.66	2768.87	0.038537	4.02	32.85	90.65	1.18
WASH304	WASH304	850.13	100-Yr	132.00	2760.03	2760.81	2760.85	2761.06	0.066796	4.08	32.36	92.51	1.22
WASH304	WASH304	850.13	100-Yr_Encroache	132.00	2760.03	2760.81	2760.85	2761.06	0.066796	4.08	32.36	92.51	1.22
WASH304	WASH304	691.11	100-Yr	132.00	2752.99	2753.68	2753.68	2753.92	0.033542	3.96	33.37	69.07	1.00
WASH304	WASH304	691.11	100-Yr_Encroache	132.00	2752.99	2753.67	2753.67	2753.92	0.034202	3.98	33.15	68.99	1.01
WASH304	WASH304	502.99	100-Yr	132.00	2743.19	2744.12	2744.40	2745.05	0.070816	7.71	17.12	35.29	1.95
WASH304	WASH304	502.99	100-Yr_Encroache	132.00	2743.19	2744.13	2744.40	2745.03	0.068277	7.60	17.37	35.33	1.91
WASH304	WASH304	424.79	100-Yr	132.00	2739.93	2740.91	2741.01	2741.35	0.031680	5.31	24.88	44.25	1.25
WASH304	WASH304	424.79	100-Yr_Encroache	132.00	2739.93	2740.91	2741.01	2741.35	0.032303	5.35	24.68	44.10	1.26
WASH304	WASH304	296	100-Yr	132.00	2733.40	2734.23	2734.45	2734.99	0.086117	7.00	18.85	52.25	2.05
WASH304	WASH304	296	100-Yr_Encroache	132.00	2733.40	2734.23	2734.45	2734.98	0.083992	6.93	19.05	52.32	2.03
WASH304	WASH304	121.66	100-Yr	132.00	2724.83	2726.10	2726.19	2726.56	0.030399	5.39	24.48	42.27	1.25
WASH304	WASH304	121.66	100-Yr_Encroache	132.00	2724.83	2726.10	2726.19	2726.56	0.030832	5.42	24.33	42.21	1.26
WASH305	WASH305	2547.49	100-Yr	270.00	2718.18	2719.52	2719.76	2720.29	0.069825	7.06	38.24	71.11	1.70
WASH305	WASH305	2547.49	100-Yr_Encroache	270.00	2718.18	2719.52	2719.76	2720.29	0.069268	7.04	38.37	71.20	1.69
WASH305	WASH305	2420.26	100-Yr	270.00	2713.00	2714.56	2714.58	2714.97	0.026929	5.14	52.54	139.71	1.17
WASH305	WASH305	2420.26	100-Yr_Encroache	270.00	2713.00	2714.55	2714.62	2714.98	0.027019	5.22	51.68	80.43	1.15
WASH305	WASH305	2276.72	100-Yr	270.00	2706.00	2708.03	2708.16	2708.51	0.089498	5.56	48.57	134.57	1.63
WASH305	WASH305	2276.72	100-Yr_Encroache	270.00	2707.43	2708.19	2708.32	2708.67	0.083337	5.58	48.41	122.00	1.56
WASH305	WASH305	2156.91	100-Yr	270.00	2701.65	2702.79	2702.81	2703.04	0.046564	3.96	68.15	151.78	1.04
WASH305	WASH305	2156.91	100-Yr_Encroache	270.00	2701.65	2702.93	2702.93	2703.19	0.037186	4.09	66.02	121.41	0.98
WASH305	WASH305	2008.5	100-Yr	282.00	2695.85	2696.55	2696.65	2696.96	0.040498	5.12	55.13	115.11	1.30
WASH305	WASH305	2008.5	100-Yr_Encroache	282.00	2695.85	2696.69	2696.81	2697.23	0.042939	5.90	47.76	78.86	1.34
WASH305	WASH305	1881.62	100-Yr	282.00	2689.97	2690.85	2690.92	2691.24	0.050443	5.04	55.91	105.80	1.22
WASH305	WASH305	1881.62	100-Yr_Encroache	282.00	2689.97	2690.90	2691.00	2691.41	0.049019	5.74	49.10	78.12	1.28
WASH305	WASH305	1803.71	100-Yr	282.00	2686.00	2686.90	2687.00	2687.29	0.051058	5.00	56.44	165.55	1.51
WASH305	WASH305	1803.71	100-Yr_Encroache	282.00	2686.44	2687.41	2687.51	2687.95	0.040494	5.91	47.74	68.06	1.24
WASH305	WASH305	1661.16	100-Yr	294.00	2678.98	2680.21	2680.35	2680.75	0.041488	5.89	49.93	102.06	1.48
WASH305	WASH305	1661.16	100-Yr_Encroache	294.00	2678.98	2680.13	2680.35	2680.89	0.060725	7.01	41.95	100.19	1.91
WASH305	WASH305	1316.04	100-Yr	304.00	2663.00	2665.77	2665.80	2666.29	0.042270	5.78	52.63	163.45	1.25
WASH305	WASH305	1316.04	100-Yr_Encroache	304.00	2663.00	2665.80	2665.80	2665.89	0.006192	2.36	128.86	167.99	0.47
WASH305	WASH305	878.28	100-Yr	307.00	2646.96	2647.98	2648.13	2648.59	0.038707	6.26	49.00	74.60	1.36
WASH305	WASH305	878.28	100-Yr_Encroache	307.00	2646.96	2647.38	2648.13	2655.49	1.374443	22.85	13.44	43.66	7.26
WASH305	WASH305	784.34	100-Yr	307.00	2642.58	2643.84	2644.09	2644.52	0.048489	6.61	46.43	64.21	1.37
WASH305	WASH305	784.34	100-Yr_Encroache	307.00	2642.58	2643.98	2644.03	2644.44	0.030762	5.46	56.19	77.59	1.13

HEC-RAS Plan: Encroach Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
WASH305	WASH305	647.38	100-Yr	307.00	2636.91	2638.73	2638.73	2638.84	0.005832	2.61	117.78	166.70	0.55
WASH305	WASH305	647.38	100-Yr_Encroache	307.00	2636.91	2638.76	2638.76	2639.04	0.009831	4.25	72.25	90.66	0.84
WASH305	WASH305	452.08	100-Yr	316.00	2628.98	2629.68	2630.25	2634.45	0.709375	17.51	18.04	42.46	4.74
WASH305	WASH305	452.08	100-Yr_Encroache	316.00	2628.98	2629.78	2630.25	2632.81	0.445466	13.97	22.62	54.05	3.81
WASH305	WASH305	276.42	100-Yr	316.00	2621.75	2622.69	2622.69	2622.98	0.033070	4.38	72.17	122.91	1.01
WASH305	WASH305	276.42	100-Yr_Encroache	316.00	2621.75	2622.72	2622.72	2623.04	0.031257	4.55	69.49	109.33	1.01
WASH305	WASH305	109.09	100-Yr	316.00	2614.00	2615.47	2615.58	2615.92	0.055381	5.40	58.52	109.90	1.30
WASH305	WASH305	109.09	100-Yr_Encroache	316.00	2614.00	2615.45	2615.58	2615.93	0.060510	5.56	56.80	109.43	1.36
WASH310	WASH310	3156.63	100-Yr	61.00	2765.24	2766.00	2766.09	2766.33	0.055706	4.65	13.13	41.65	1.46
WASH310	WASH310	3156.63	100-Yr_Encroache	59.00	2765.24	2765.99	2766.10	2766.32	0.055657	4.62	12.76	38.96	1.42
WASH310	WASH310	3066.28	100-Yr	90.00	2760.00	2760.96	2761.09	2761.45	0.052631	5.64	15.96	27.33	1.30
WASH310	WASH310	3066.28	100-Yr_Encroache	90.00	2760.00	2760.96	2761.09	2761.45	0.052396	5.63	15.99	27.35	1.30
WASH310	WASH310	2892.1	100-Yr	94.00	2750.98	2751.97	2752.10	2752.43	0.050937	5.39	17.42	29.53	1.24
WASH310	WASH310	2892.1	100-Yr_Encroache	94.00	2750.98	2751.97	2752.10	2752.43	0.051136	5.40	17.40	29.52	1.24
WASH310	WASH310	2659.62	100-Yr	94.00	2740.74	2742.02	2742.03	2742.42	0.036765	5.08	18.49	24.83	1.04
WASH310	WASH310	2659.62	100-Yr_Encroache	94.00	2740.74	2742.02	2742.03	2742.42	0.036633	5.08	18.51	24.84	1.04
WASH310	WASH310	2458.9	100-Yr	94.00	2731.84	2733.00	2733.18	2733.68	0.052041	6.60	14.25	18.54	1.33
WASH310	WASH310	2458.9	100-Yr_Encroache	94.00	2731.84	2733.00	2733.18	2733.68	0.052259	6.61	14.23	18.53	1.33
WASH310	WASH310	2317.03	100-Yr	94.00	2725.98	2727.61	2727.61	2728.07	0.033891	5.42	17.33	19.40	1.01
WASH310	WASH310	2317.03	100-Yr_Encroache	94.00	2725.98	2727.61	2727.61	2728.07	0.033891	5.42	17.33	19.40	1.01
WASH310	WASH310	2190.27	100-Yr	94.00	2720.21	2721.78	2722.09	2722.68	0.053904	7.60	12.38	13.77	1.41
WASH310	WASH310	2190.27	100-Yr_Encroache	94.00	2720.21	2721.78	2722.09	2722.68	0.053904	7.60	12.38	13.77	1.41
WASH310	WASH310	2072	100-Yr	94.00	2715.25	2717.08	2717.18	2717.47	0.034838	5.01	18.78	57.56	1.55
WASH310	WASH310	2072	100-Yr_Encroache	94.00	2715.25	2717.08	2717.18	2717.47	0.034838	5.01	18.78	57.56	1.55
WASH310	WASH310	1948.44	100-Yr	94.00	2709.92	2710.91	2711.20	2711.80	0.061816	7.57	12.42	16.03	1.52
WASH310	WASH310	1948.44	100-Yr_Encroache	94.00	2709.92	2710.91	2711.20	2711.80	0.061816	7.57	12.42	16.03	1.52
WASH310	WASH310	1796.97	100-Yr	144.00	2702.93	2704.58	2704.58	2704.93	0.038782	4.71	30.58	47.34	1.03
WASH310	WASH310	1796.97	100-Yr_Encroache	144.00	2702.93	2704.58	2704.58	2704.93	0.038782	4.71	30.58	47.34	1.03
WASH310	WASH310	1653.76	100-Yr	144.00	2696.05	2697.82	2698.02	2698.75	0.047402	7.75	18.58	15.75	1.26
WASH310	WASH310	1653.76	100-Yr_Encroache	144.00	2696.05	2697.82	2698.02	2698.75	0.047402	7.75	18.58	15.75	1.26
WASH310	WASH310	1548.34	100-Yr	144.00	2691.74	2693.12	2693.29	2693.88	0.044148	7.01	20.53	21.66	1.27
WASH310	WASH310	1548.34	100-Yr_Encroache	144.00	2691.74	2693.12	2693.29	2693.88	0.044148	7.01	20.53	21.66	1.27
WASH310	WASH310	1415.8	100-Yr	144.00	2686.48	2687.35	2687.47	2687.81	0.046016	5.44	26.47	53.57	1.36
WASH310	WASH310	1415.8	100-Yr_Encroache	144.00	2686.48	2687.44	2687.59	2688.05	0.043163	6.31	22.83	36.45	1.40
WASH310	WASH310	1202.35	100-Yr	144.00	2677.94	2678.87	2679.03	2679.42	0.033907	5.96	24.17	36.47	1.29
WASH310	WASH310	1202.35	100-Yr_Encroache	144.00	2677.94	2678.85	2679.04	2679.44	0.037754	6.20	23.22	35.49	1.35
WASH310	WASH310	1052.07	100-Yr	144.00	2672.00	2673.17	2673.32	2673.75	0.042418	6.08	23.70	35.21	1.31
WASH310	WASH310	1052.07	100-Yr_Encroache	144.00	2672.00	2673.20	2673.32	2673.73	0.038032	5.81	24.81	36.33	1.24
WASH310	WASH310	918.02	100-Yr	149.00	2665.95	2667.22	2667.37	2667.89	0.044844	6.60	22.59	26.93	1.27
WASH310	WASH310	918.02	100-Yr_Encroache	149.00	2665.95	2667.19	2667.37	2667.91	0.049350	6.84	21.79	26.56	1.33
WASH310	WASH310	835.22	100-Yr	149.00	2662.63	2664.17	2664.19	2664.61	0.033894	5.32	28.02	34.97	1.05
WASH310	WASH310	835.22	100-Yr_Encroache	149.00	2662.63	2664.17	2664.19	2664.61	0.033336	5.29	28.18	35.00	1.04
WASH310	WASH310	673.3	100-Yr	149.00	2656.56	2657.63	2657.86	2658.43	0.042764	7.15	20.85	30.03	1.51
WASH310	WASH310	673.3	100-Yr_Encroache	149.00	2656.56	2657.63	2657.86	2658.43	0.043421	7.19	20.73	29.99	1.52
WASH310	WASH310	522.83	100-Yr	149.00	2650.43	2651.42	2651.54	2651.91	0.042740	5.60	26.61	47.35	1.32
WASH310	WASH310	522.83	100-Yr_Encroache	149.00	2650.43	2651.42	2651.53	2651.92	0.041963	5.65	26.37	44.47	1.29
WASH310	WASH310	369.06	100-Yr	149.00	2643.65	2644.66	2644.82	2645.29	0.043164	6.35	23.45	36.87	1.40
WASH310	WASH310	369.06	100-Yr_Encroache	149.00	2643.65	2644.66	2644.82	2645.29	0.044044	6.40	23.27	36.67	1.42
WASH310	WASH310	170.27	100-Yr	149.00	2634.99	2635.78	2635.89	2636.29	0.047145	5.77	25.82	41.86	1.30
WASH310	WASH310	170.27	100-Yr_Encroache	149.00	2634.99	2635.78	2635.90	2636.29	0.046201	5.74	25.98	41.88	1.28
WASH310	WASH310	67.28	100-Yr	149.00	2630.08	2631.48	2631.49	2631.77	0.039834	4.32	34.45	62.84	1.03
WASH310	WASH310	67.28	100-Yr_Encroache	149.00	2630.08	2631.47	2631.49	2631.77	0.040554	4.36	34.21	62.60	1.04
WASH335	WASH335	1845.55	100-Yr	76.00	2719.99	2721.93	2722.25	2723.09	0.067234	8.67	8.77	6.90	1.36
WASH335	WASH335	1845.55	100-Yr_Encroache	76.00	2719.99	2721.93	2722.25	2723.09	0.067234	8.67	8.77	6.90	1.36
WASH335	WASH335	1767.51	100-Yr	76.00	2716.90	2719.08	2719.08	2719.79	0.033892	6.73	11.30	8.13	1.01
WASH335	WASH335	1767.51	100-Yr_Encroache	76.00	2716.90	2719.08	2719.08	2719.79	0.033892	6.73	11.30	8.13	1.01
WASH335	WASH335	1616.42	100-Yr	76.00	2710.94	2712.69	2712.89	2713.50	0.051926	7.22	10.53	10.21	1.25
WASH335	WASH335	1616.42	100-Yr_Encroache	76.00	2710.94	2712.69	2712.87	2713.51	0.052078	7.23	10.51	10.20	1.26

HEC-RAS Plan: Encroach Locations: User Defined (Continued)

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
WASH335	WASH335	1467.16	100-Yr	76.00	2704.99	2706.83	2707.05	2707.71	0.030074	7.52	10.10	9.72	1.30
WASH335	WASH335	1467.16	100-Yr_Encroache	76.00	2704.99	2706.83	2707.05	2707.71	0.030018	7.52	10.11	9.72	1.30
WASH335	WASH335	1328.24	100-Yr	75.00	2699.00	2700.37	2700.69	2701.43	0.075398	8.28	9.06	11.02	1.61
WASH335	WASH335	1328.24	100-Yr_Encroache	75.00	2699.00	2700.36	2700.69	2701.43	0.075524	8.28	9.05	11.02	1.61
WASH335	WASH335	1084.9	100-Yr	75.00	2687.99	2689.68	2689.68	2690.21	0.033012	5.82	12.89	12.49	1.01
WASH335	WASH335	1084.9	100-Yr_Encroache	75.00	2687.99	2689.68	2689.68	2690.21	0.033012	5.82	12.89	12.49	1.01
WASH335	WASH335	907.49	100-Yr	75.00	2678.92	2680.31	2680.71	2681.58	0.077054	9.06	8.28	8.24	1.59
WASH335	WASH335	907.49	100-Yr_Encroache	75.00	2678.92	2680.31	2680.71	2681.58	0.077004	9.06	8.28	8.24	1.59
WASH335	WASH335	712.92	100-Yr	75.00	2670.98	2672.67	2672.70	2673.26	0.026112	6.16	12.18	11.20	1.04
WASH335	WASH335	712.92	100-Yr_Encroache	75.00	2670.98	2672.67	2672.70	2673.26	0.026112	6.16	12.18	11.20	1.04
WASH335	WASH335	630.49	100-Yr	75.00	2666.90	2668.21	2668.61	2669.48	0.095779	9.06	8.28	9.70	1.73
WASH335	WASH335	630.49	100-Yr_Encroache	75.00	2666.90	2668.21	2668.61	2669.48	0.095779	9.06	8.28	9.70	1.73
WASH335	WASH335	480.5	100-Yr	75.00	2660.75	2661.82	2661.86	2662.21	0.027545	5.00	15.01	22.22	1.07
WASH335	WASH335	480.5	100-Yr_Encroache	75.00	2660.75	2661.82	2661.86	2662.21	0.027545	5.00	15.01	22.22	1.07
WASH335	WASH335	186.85	100-Yr	75.00	2648.85	2649.32	2649.43	2649.71	0.074144	5.05	14.85	47.30	1.59
WASH335	WASH335	186.85	100-Yr_Encroache	75.00	2648.85	2649.33	2649.46	2649.79	0.072878	5.46	13.72	40.30	1.65
WASH335	WASH335	45.45	100-Yr	75.00	2643.00	2643.94	2644.01	2644.27	0.023365	4.60	16.30	31.57	1.13
WASH335	WASH335	45.45	100-Yr_Encroache	75.00	2643.00	2643.94	2644.01	2644.27	0.024004	4.65	16.14	31.36	1.14
WASH340	WASH340	961.19	100-Yr	54.00	2685.99	2688.16	2688.16	2688.44	0.043907	4.29	12.59	23.51	1.03
WASH340	WASH340	961.19	100-Yr_Encroache	54.00	2685.99	2688.16	2688.16	2688.44	0.043907	4.29	12.59	23.51	1.03
WASH340	WASH340	742.14	100-Yr	54.00	2676.95	2678.15	2678.44	2679.13	0.040596	7.96	6.78	7.62	1.49
WASH340	WASH340	742.14	100-Yr_Encroache	54.00	2676.95	2678.15	2678.44	2679.13	0.040596	7.96	6.78	7.62	1.49
WASH340	WASH340	590.9	100-Yr	54.00	2669.97	2671.60	2671.79	2672.54	0.046714	7.78	6.94	5.66	1.24
WASH340	WASH340	590.9	100-Yr_Encroache	54.00	2669.97	2671.60	2671.79	2672.54	0.046714	7.78	6.94	5.66	1.24
WASH340	WASH340	374.63	100-Yr	54.00	2662.80	2663.74	2663.88	2664.30	0.030860	5.98	9.03	13.71	1.30
WASH340	WASH340	374.63	100-Yr_Encroache	54.00	2662.80	2663.75	2663.88	2664.32	0.030735	6.07	8.90	12.77	1.28
WASH340	WASH340	134.72	100-Yr	54.00	2652.84	2653.80	2653.90	2654.33	0.058837	5.82	9.28	38.65	1.33
WASH340	WASH340	134.72	100-Yr_Encroache	54.00	2652.84	2653.80	2653.90	2654.33	0.059379	5.86	9.21	38.41	1.34
WASH340	WASH340	2.81	100-Yr	54.00	2646.97	2647.95	2648.07	2648.36	0.035517	5.14	10.50	26.29	1.43
WASH340	WASH340	2.81	100-Yr_Encroache	54.00	2646.97	2647.95	2648.07	2648.36	0.035303	5.13	10.54	26.34	1.43

O SITE BOUNDARY CROSS SECTION

HY-8 Culvert Calculation Output

HY-8 Culvert Analysis Report
Culvert: ON-305A

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 16 cfs

Design Flow: 47 cfs

Maximum Flow: 121 cfs

Table 4 - Summary of Culvert Flows at Crossing: ON305A

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2737.94	16.00	16.00	0.00	1
2738.22	26.50	26.50	0.00	1
2738.46	37.00	37.00	0.00	1
2738.71	47.00	47.00	0.00	1
2738.96	58.00	58.00	0.00	1
2739.18	68.50	68.50	0.00	1
2739.39	79.00	79.00	0.00	1
2739.59	89.50	89.50	0.00	1
2739.80	100.00	100.00	0.00	1
2740.00	110.50	110.22	0.00	19
2740.07	121.00	113.83	6.92	6
2740.00	110.25	110.25	0.00	Overtopping

Rating Curve Plot for Crossing: ON305A

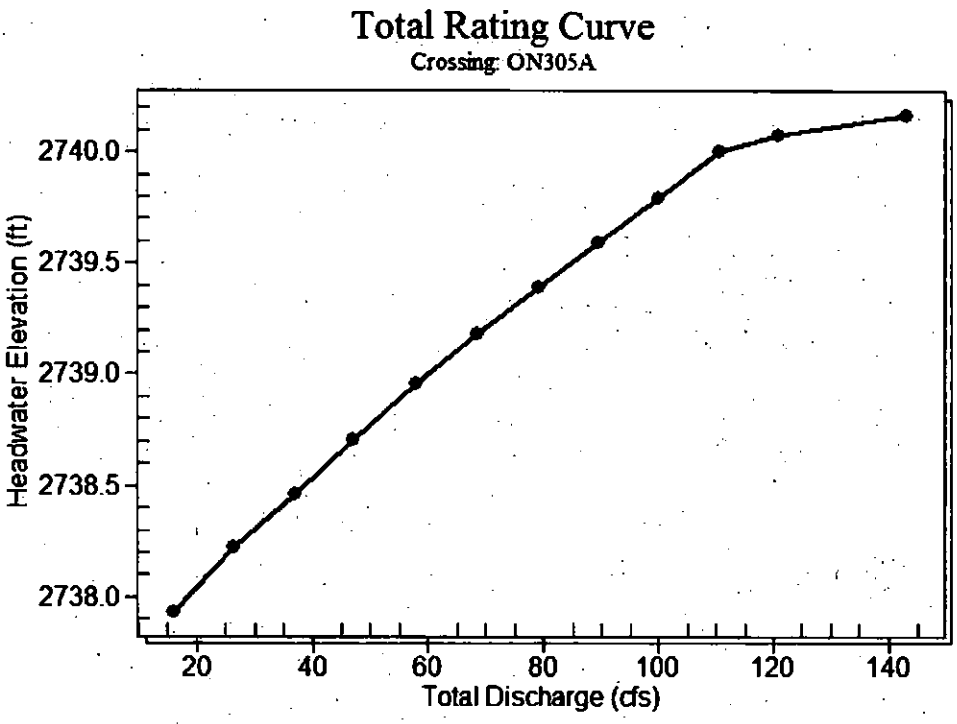


Table 5 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
16.00	16.00	2737.94	0.936	0.0*	1-S2n	0.329	0.720	0.329	0.750	12.238	0.000
26.50	26.50	2738.22	1.222	0.0*	1-S2n	0.422	0.934	0.475	0.750	12.055	0.000
37.00	37.00	2738.46	1.464	0.0*	1-S2n	0.515	1.111	0.559	0.750	13.632	0.000
47.00	47.00	2738.71	1.709	0.0*	1-S2n	0.581	1.260	0.639	0.750	14.086	0.000
58.00	58.00	2738.96	1.960	0.0*	1-S2n	0.640	1.410	0.714	0.750	14.861	0.000
68.50	68.50	2739.18	2.180	0.0*	1-S2n	0.696	1.537	0.786	0.750	15.408	0.000
79.00	79.00	2739.39	2.388	0.0*	1-S2n	0.753	1.652	0.856	0.750	15.895	0.000
89.50	89.50	2739.59	2.592	0.0*	1-S2n	0.809	1.764	0.923	0.750	16.089	0.000
100.00	100.00	2739.80	2.796	0.0*	1-S2n	0.854	1.871	0.988	0.750	16.383	0.000
110.50	110.22	2740.00	2.999	0.0*	1-S2n	0.895	1.967	1.048	0.750	16.676	0.000
121.00	113.83	2740.07	3.073	0.0*	5-S2n	0.910	1.999	1.069	0.750	16.786	0.000

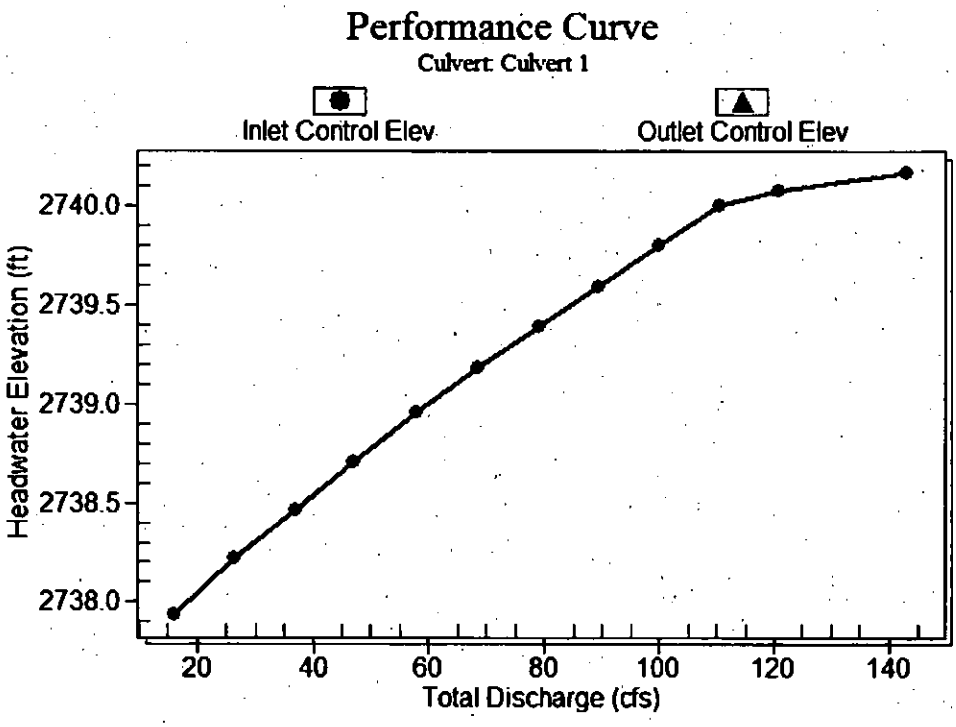
* Full Flow Headwater elevation is below inlet invert.

Straight Culvert

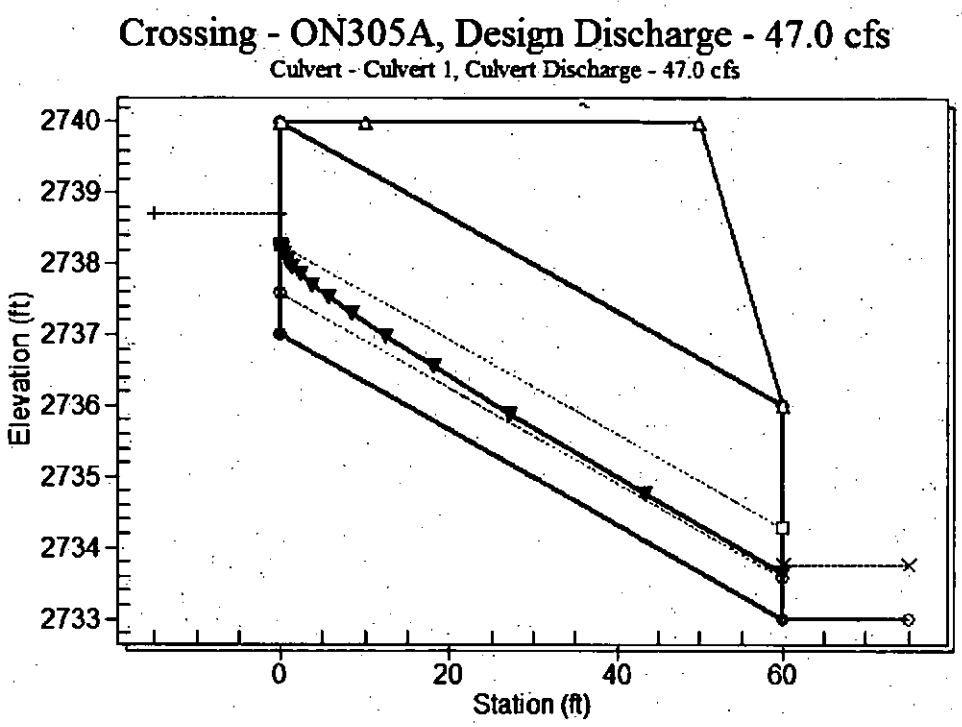
Inlet Elevation (invert): 2737.00 ft, Outlet Elevation (invert): 2733.00 ft

Culvert Length: 60.13 ft, Culvert Slope: 0.0667

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 2737.00 ft
Outlet Station: 60.00 ft
Outlet Elevation: 2733.00 ft
Number of Barrels: 3

Culvert Data Summary - Culvert 1

Barrel Shape: Circular
Barrel Diameter: 3.00 ft
Barrel Material: Concrete
Embedment: 0.00 in
Barrel Manning's n: 0.0120
Culvert Type: Straight
Inlet Configuration: Square Edge with Headwall
Inlet Depression: NONE

Table 6 - Downstream Channel Rating Curve (Crossing: ON305A)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
16.00	2733.75	0.75
26.50	2733.75	0.75
37.00	2733.75	0.75
47.00	2733.75	0.75
58.00	2733.75	0.75
68.50	2733.75	0.75
79.00	2733.75	0.75
89.50	2733.75	0.75
100.00	2733.75	0.75
110.50	2733.75	0.75
121.00	2733.75	0.75

Tailwater Channel Data - ON305A

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2733.75 ft

Roadway Data for Crossing: ON305A

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2740.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-305B

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 16 cfs

Design Flow: 47 cfs

Maximum Flow: 121 cfs

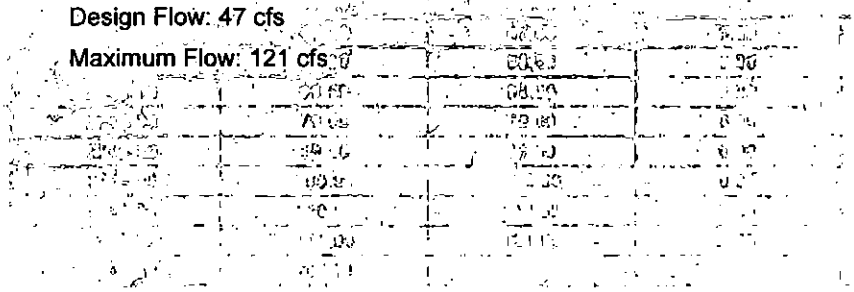


Table 8 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
16.00	16.00	2744.94	0.936	0.0*	1-S2n	0.329	0.720	0.329	1.000	12.238	0.000
26.50	26.50	2745.22	1.222	0.0*	1-S2n	0.422	0.934	0.475	1.000	12.055	0.000
37.00	37.00	2745.46	1.464	0.0*	1-S2n	0.515	1.111	0.559	1.000	13.632	0.000
47.00	47.00	2745.71	1.709	0.0*	1-S2n	0.581	1.260	0.639	1.000	14.086	0.000
58.00	58.00	2745.96	1.960	0.0*	1-S2n	0.640	1.410	0.714	1.000	14.861	0.000
68.50	68.50	2746.18	2.180	0.0*	1-S2n	0.696	1.537	0.786	1.000	15.408	0.000
79.00	79.00	2746.39	2.388	0.0*	1-S2n	0.753	1.652	0.856	1.000	15.895	0.000
89.50	89.50	2746.59	2.592	0.0*	1-S2n	0.809	1.764	0.923	1.000	16.089	0.000
100.00	100.00	2746.80	2.796	0.0*	1-S2n	0.854	1.871	0.988	1.000	16.383	0.000
110.50	110.50	2747.00	3.005	0.0*	5-S2n	0.896	1.969	1.050	1.000	16.684	0.000
121.00	121.00	2747.22	3.224	0.0*	5-S2n	0.939	2.066	1.109	1.000	17.008	0.000

* Full Flow Headwater elevation is below inlet invert.

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Straight Culvert

Inlet Elevation (invert): 2744.00 ft, Outlet Elevation (invert): 2740.00 ft

Culvert Length: 60.13 ft, Culvert Slope: 0.0667

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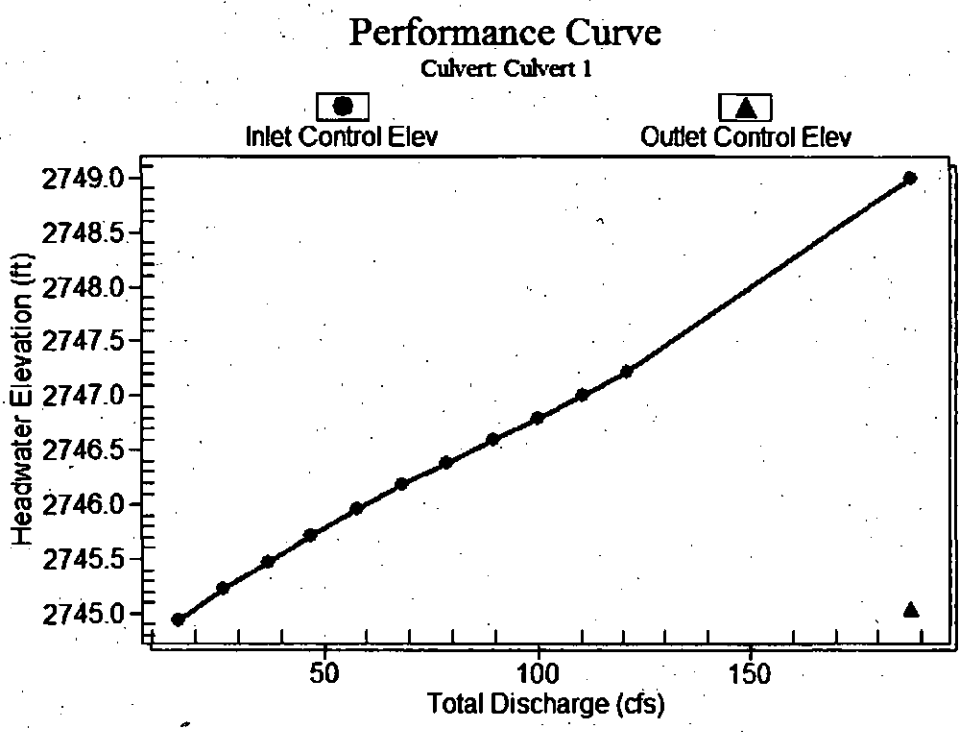
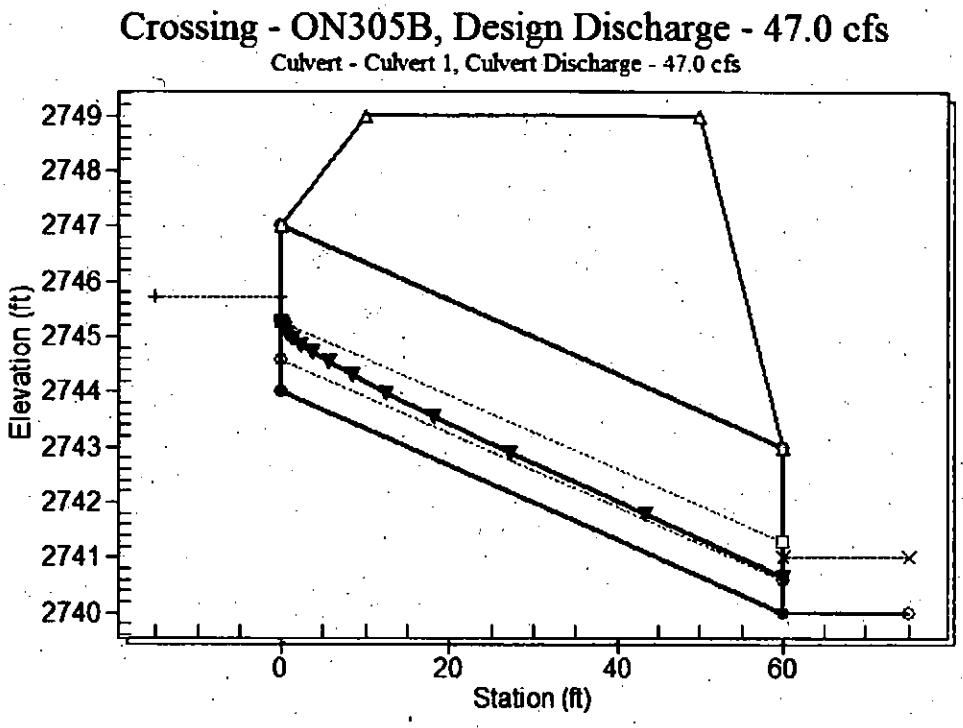
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 2744.00 ft
Outlet Station: 60.00 ft
Outlet Elevation: 2740.00 ft
Number of Barrels: 3

Culvert Data Summary - Culvert 1

Barrel Shape: Circular
Barrel Diameter: 3.00 ft
Barrel Material: Concrete
Embedment: 0.00 in
Barrel Manning's n: 0.0120
Culvert Type: Straight
Inlet Configuration: Square Edge with Headwall
Inlet Depression: NONE

Table 9 - Downstream Channel Rating Curve (Crossing: ON305B)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
16.00	2741.00	1.00
26.50	2741.00	1.00
37.00	2741.00	1.00
47.00	2741.00	1.00
58.00	2741.00	1.00
68.50	2741.00	1.00
79.00	2741.00	1.00
89.50	2741.00	1.00
100.00	2741.00	1.00
110.50	2741.00	1.00
121.00	2741.00	1.00

Tailwater Channel Data - ON305B

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2741.00 ft

Roadway Data for Crossing: ON305B

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2749.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-285

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 42 cfs

Design Flow: 123 cfs

Maximum Flow: 315 cfs

Table 10 - Summary of Culvert Flows at Crossing: ON285

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2638.25	42.00	42.00	0.00	1
2638.63	69.30	69.30	0.00	1
2638.94	96.60	96.60	0.00	1
2639.27	123.00	123.00	0.00	1
2639.59	151.20	151.20	0.00	1
2639.87	178.50	178.50	0.00	1
2640.14	205.80	205.80	0.00	1
2640.40	233.10	233.10	0.00	1
2640.65	260.40	260.40	0.00	1
2640.92	287.70	287.70	0.00	1
2641.19	315.00	315.00	0.00	1
2642.00	389.61	389.61	0.00	Overtopping

Rating Curve Plot for Crossing: ON285

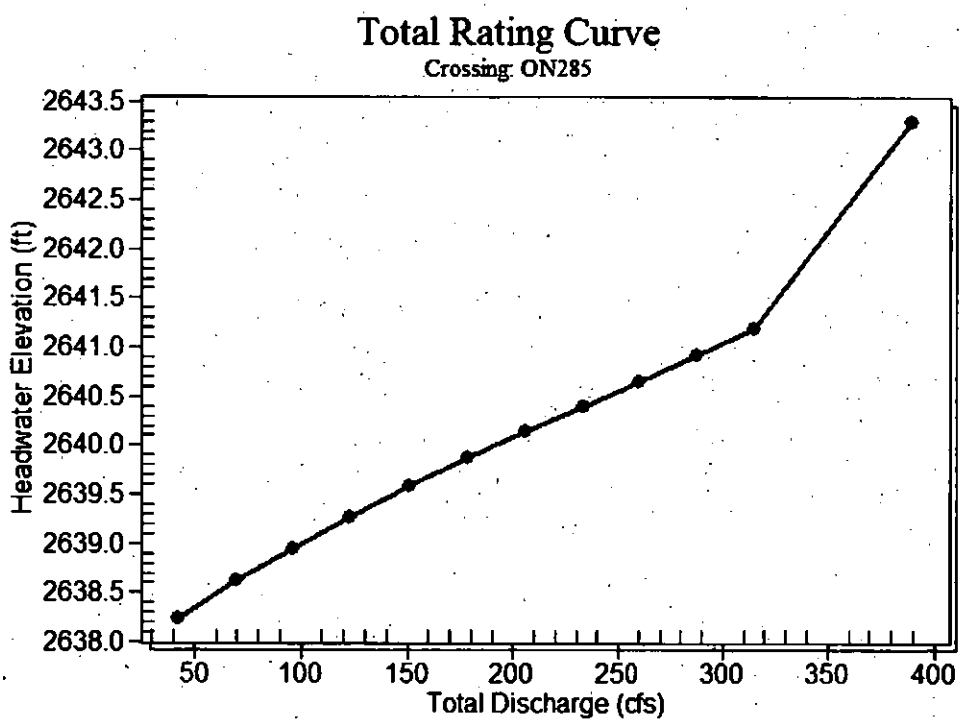


Table 11 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
42.00	42.00	2638.25	1.246	0.0*	1-S2n	0.473	0.940	0.538	1.750	10.043	0.000
69.30	69.30	2638.63	1.625	0.0*	1-S2n	0.618	1.216	0.709	1.750	11.462	0.000
96.60	96.60	2638.94	1.944	0.0*	1-S2n	0.749	1.449	0.855	1.750	12.159	0.000
123.00	123.00	2639.27	2.265	0.0*	1-S2n	0.834	1.640	0.984	1.750	12.716	0.000
151.20	151.20	2639.59	2.585	0.073	1-S2n	0.924	1.833	1.112	1.750	13.281	0.000
178.50	178.50	2639.87	2.870	0.333	1-S2n	1.012	1.999	1.227	1.750	13.599	0.000
205.80	205.80	2640.14	3.138	0.593	1-S2n	1.098	2.149	1.335	1.750	13.961	0.000
233.10	233.10	2640.40	3.397	0.864	1-S2n	1.164	2.294	1.439	1.750	14.320	0.000
260.40	260.40	2640.65	3.654	1.144	1-S2n	1.231	2.432	1.539	1.750	14.601	0.000
287.70	287.70	2640.92	3.916	1.429	1-S2n	1.297	2.560	1.636	1.750	14.860	0.000
315.00	315.00	2641.19	4.185	1.727	5-S2n	1.364	2.685	1.728	1.750	15.135	0.000

* Full Flow Headwater elevation is below inlet invert.

****

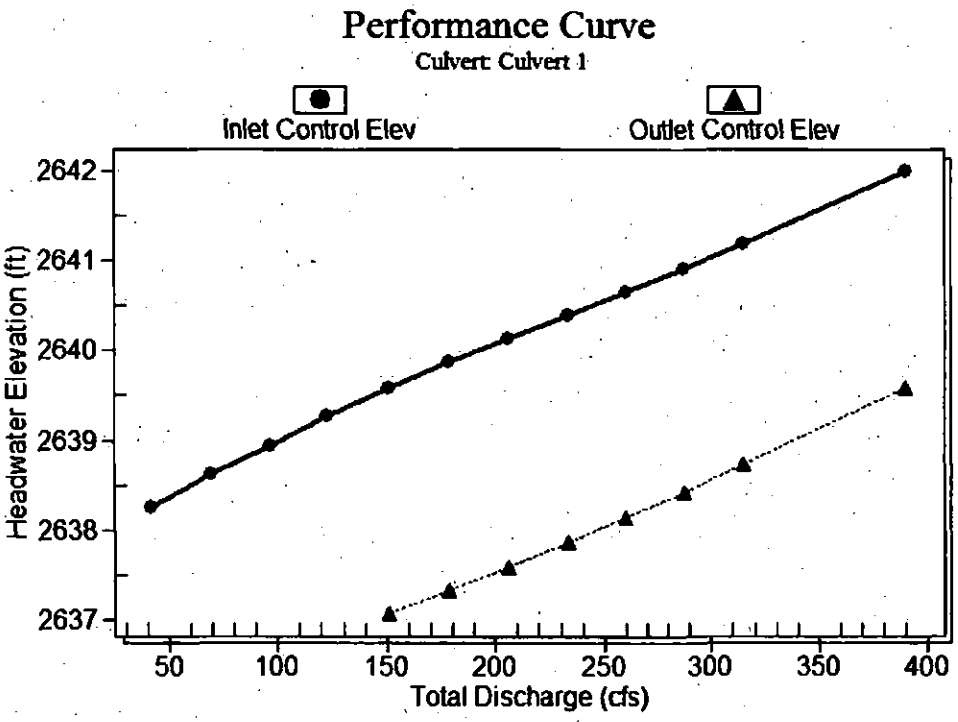
Straight Culvert

Inlet Elevation (invert): 2637.00 ft, Outlet Elevation (invert): 2635.00 ft

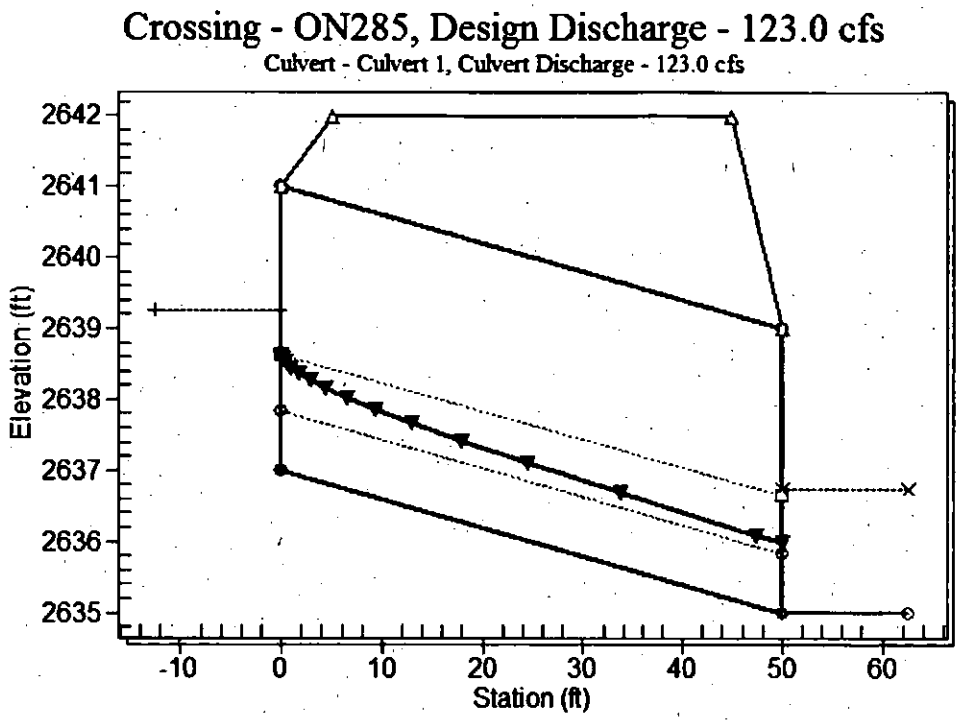
Culvert Length: 50.04 ft, Culvert Slope: 0.0400

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 2637.00 ft
Outlet Station: 50.00 ft
Outlet Elevation: 2635.00 ft
Number of Barrels: 4

Culvert Data Summary - Culvert 1

Barrel Shape: Circular
Barrel Diameter: 4.00 ft
Barrel Material: Concrete
Embedment: 0.00 in
Barrel Manning's n: 0.0120
Culvert Type: Straight
Inlet Configuration: Square Edge with Headwall
Inlet Depression: NONE

Table 12 - Downstream Channel Rating Curve (Crossing: ON285)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
42.00	2636.75	1.75
69.30	2636.75	1.75
96.60	2636.75	1.75
123.00	2636.75	1.75
151.20	2636.75	1.75
178.50	2636.75	1.75
205.80	2636.75	1.75
233.10	2636.75	1.75
260.40	2636.75	1.75
287.70	2636.75	1.75
315.00	2636.75	1.75

Tailwater Channel Data - ON285

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2636.75 ft

Roadway Data for Crossing: ON285

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2642.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-310

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 12 cfs

Design Flow: 34 cfs

Maximum Flow: 90 cfs

Table 13 - Summary of Culvert Flows at Crossing: ON310

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2737.94	12.00	12.00	0.00	1
2738.28	19.80	19.80	0.00	1
2738.58	27.60	27.60	0.00	1
2738.81	34.00	34.00	0.00	1
2739.15	43.20	43.20	0.00	1
2739.47	51.00	51.00	0.00	1
2739.84	58.80	58.80	0.00	1
2740.27	66.60	66.60	0.00	1
2740.76	74.40	74.40	0.00	1
2741.31	82.20	82.20	0.00	1
2741.91	90.00	90.00	0.00	1
2742.00	91.05	91.05	0.00	Overtopping

Rating Curve Plot for Crossing: ON310

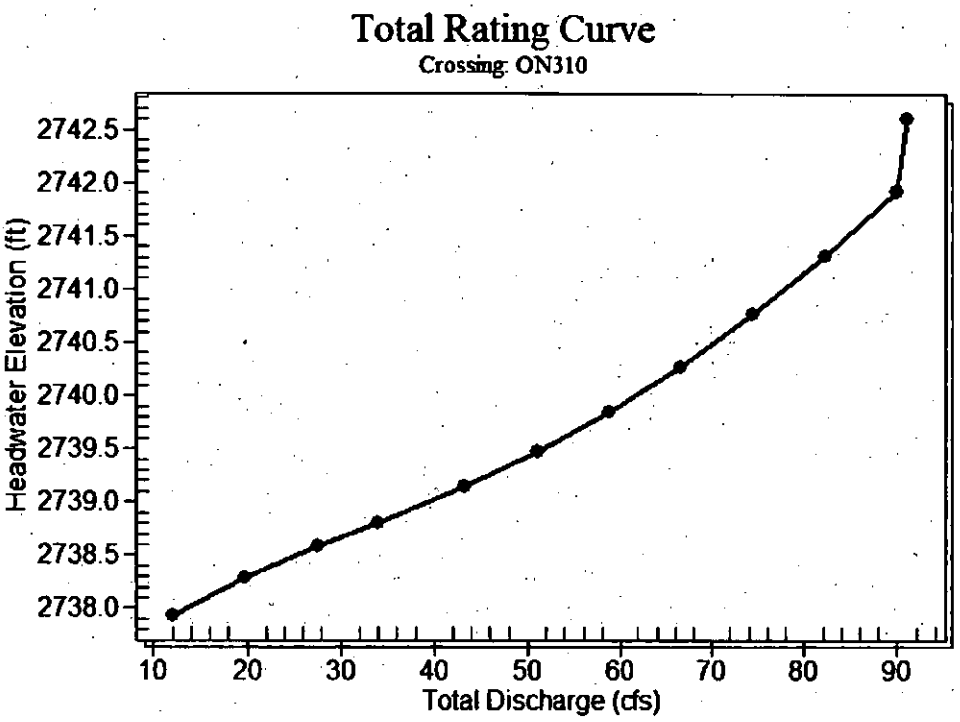


Table 14 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
12.00	12.00	2737.94	0.938	0.0*	1-JS1t	0.382	0.697	1.750	1.750	1.376	0.000
19.80	19.80	2738.28	1.283	0.0*	1-S2n	0.489	0.910	0.522	1.750	10.091	0.000
27.60	27.60	2738.58	1.580	0.020	1-S2n	0.583	1.081	0.629	1.750	10.819	0.000
34.00	34.00	2738.81	1.809	0.160	1-S2n	0.649	1.204	0.711	1.750	11.306	0.000
43.20	43.20	2739.15	2.148	0.411	5-S2n	0.741	1.363	0.820	1.750	11.861	0.000
51.00	51.00	2739.47	2.471	0.671	5-S2n	0.809	1.484	0.909	1.750	12.233	0.000
58.80	58.80	2739.84	2.842	0.975	5-S2n	0.877	1.589	0.989	1.750	12.658	0.000
66.60	66.60	2740.27	3.269	1.321	5-S2n	0.942	1.680	1.071	1.750	12.965	0.000
74.40	74.40	2740.78	3.758	1.839	5-S2n	1.005	1.756	1.148	1.750	13.306	0.000
82.20	82.20	2741.31	4.307	2.302	5-S2n	1.067	1.817	1.221	1.750	13.648	0.000
90.00	90.00	2741.91	4.914	2.801	5-S2n	1.129	1.863	1.295	1.750	13.936	0.000

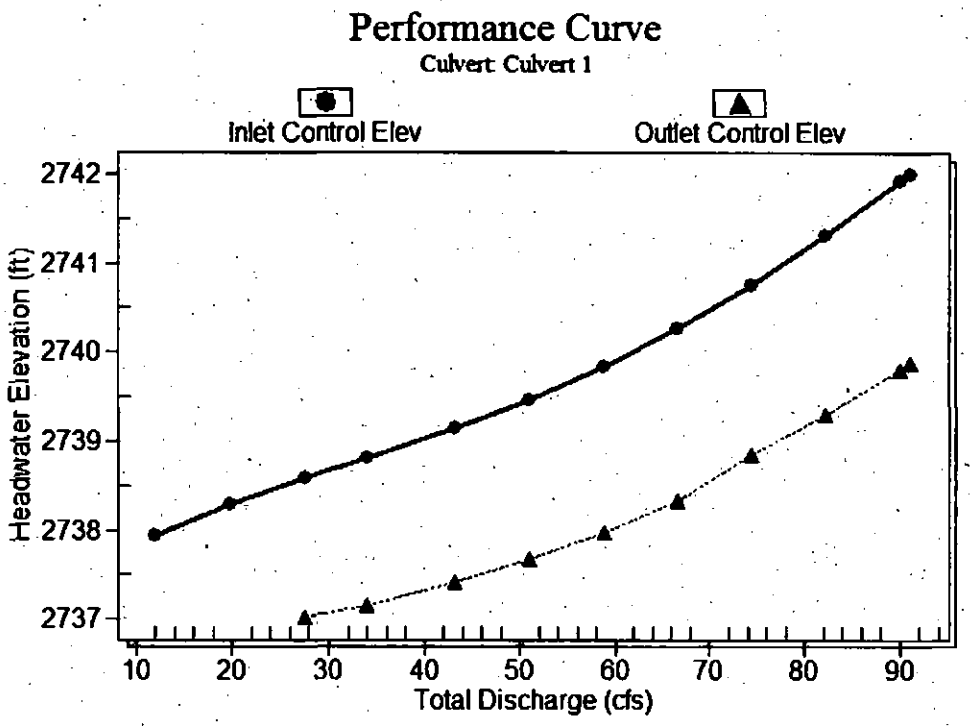
* Full Flow Headwater elevation is below inlet invert.

Straight Culvert

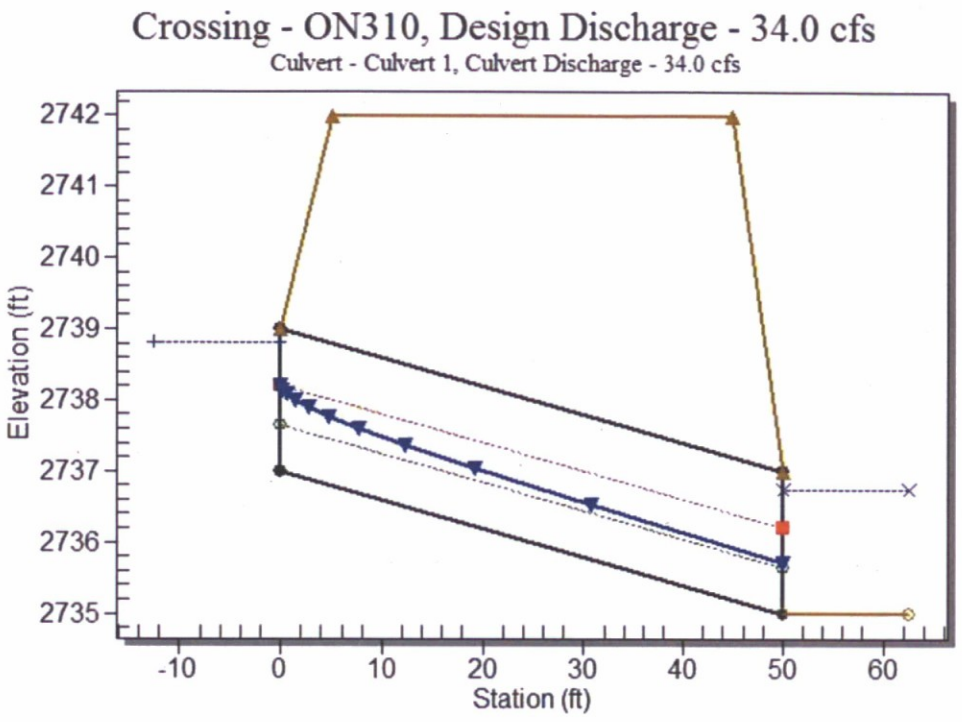
Inlet Elevation (invert): 2737.00 ft, Outlet Elevation (invert): 2735.00 ft

Culvert Length: 50.04 ft, Culvert Slope: 0.0400

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 2737.00 ft

Outlet Station: 50.00 ft

Outlet Elevation: 2735.00 ft

Number of Barrels: 3

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 15 - Downstream Channel Rating Curve (Crossing: ON310)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
12.00	2736.75	1.75
19.80	2736.75	1.75
27.60	2736.75	1.75
34.00	2736.75	1.75
43.20	2736.75	1.75
51.00	2736.75	1.75
58.80	2736.75	1.75
66.60	2736.75	1.75
74.40	2736.75	1.75
82.20	2736.75	1.75
90.00	2736.75	1.75

Tailwater Channel Data - ON310

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2736.75 ft

Roadway Data for Crossing: ON310

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2742.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-312

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 21 cfs

Design Flow: 60 cfs

Maximum Flow: 156 cfs

Table 16 - Summary of Culvert Flows at Crossing: ON312

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2665.11	21.00	21.00	0.00	1
2665.44	34.50	34.50	0.00	1
2665.77	48.00	48.00	0.00	1
2666.04	60.00	60.00	0.00	1
2666.35	75.00	75.00	0.00	1
2666.61	88.50	88.50	0.00	1
2666.88	102.00	102.00	0.00	1
2667.15	115.50	115.50	0.00	1
2667.44	129.00	129.00	0.00	1
2667.75	142.50	142.50	0.00	1
2668.10	156.00	156.00	0.00	1
2673.00	282.43	282.43	0.00	Overtopping

Rating Curve Plot for Crossing: ON312

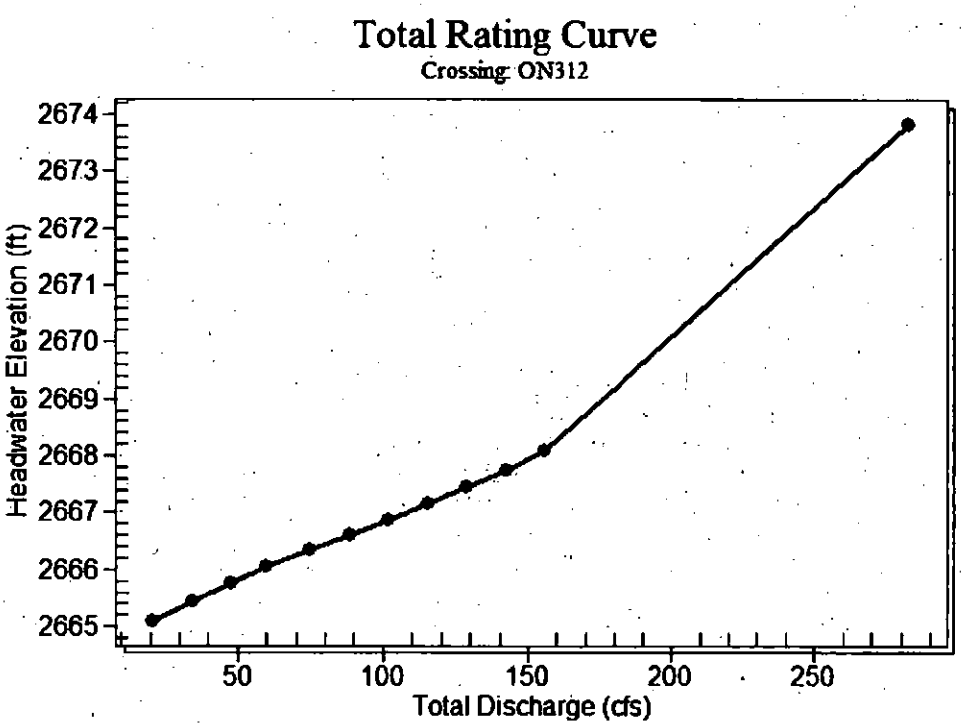


Table 17 - Culvert Summary Table: Culvert 1

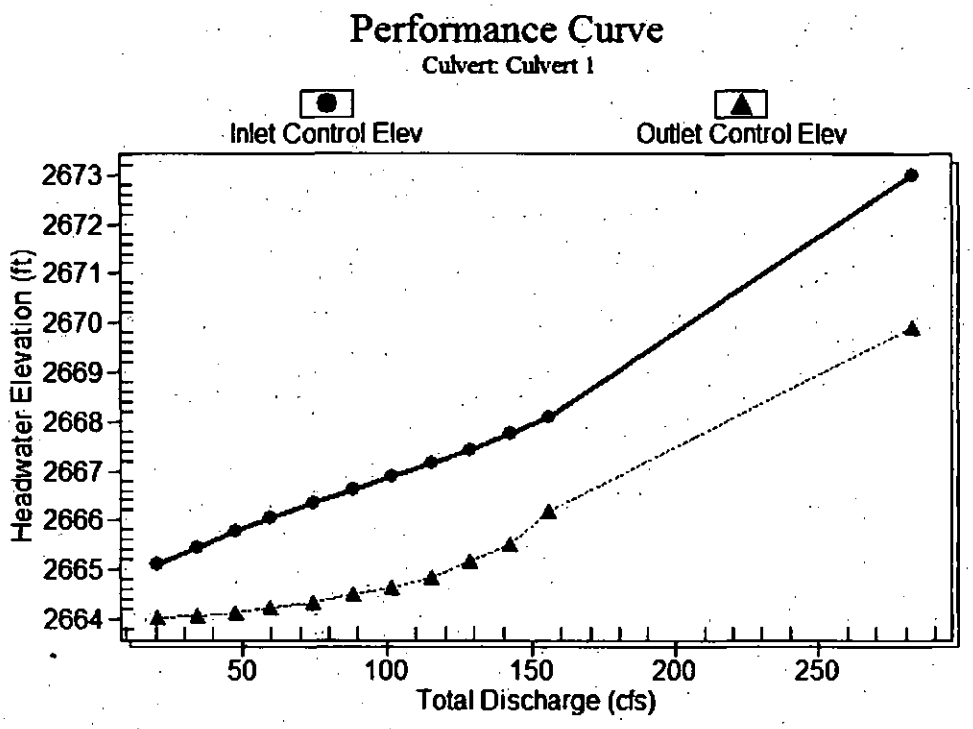
Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
21.00	21.00	2665.11	1.107	0.028	1-JS1t	0.428	0.830	2.000	2.000	1.400	0.000
34.50	34.50	2665.44	1.440	0.074	1-S2n	0.567	1.070	0.618	2.000	10.841	0.000
48.00	48.00	2665.77	1.773	0.144	1-S2n	0.661	1.275	0.748	2.000	11.538	0.000
60.00	60.00	2666.04	2.043	0.225	1-S2n	0.744	1.438	0.850	2.000	12.193	0.000
75.00	75.00	2666.35	2.350	0.351	1-S2n	0.841	1.609	0.968	2.000	12.637	0.000
88.50	88.50	2666.61	2.612	0.489	1-S2n	0.912	1.754	1.069	2.000	13.049	0.000
102.00	102.00	2666.88	2.875	0.649	1-S2n	0.982	1.890	1.165	2.000	13.387	0.000
115.50	115.50	2667.15	3.148	0.846	5-S2n	1.053	2.014	1.255	2.000	13.719	0.000
129.00	129.00	2667.44	3.438	1.172	5-S2n	1.119	2.134	1.343	2.000	14.032	0.000
142.50	142.50	2667.75	3.754	1.509	5-S2n	1.179	2.242	1.428	2.000	14.311	0.000
156.00	156.00	2668.10	4.098	2.189	5-S2n	1.239	2.342	1.510	2.000	14.585	0.000

Straight Culvert

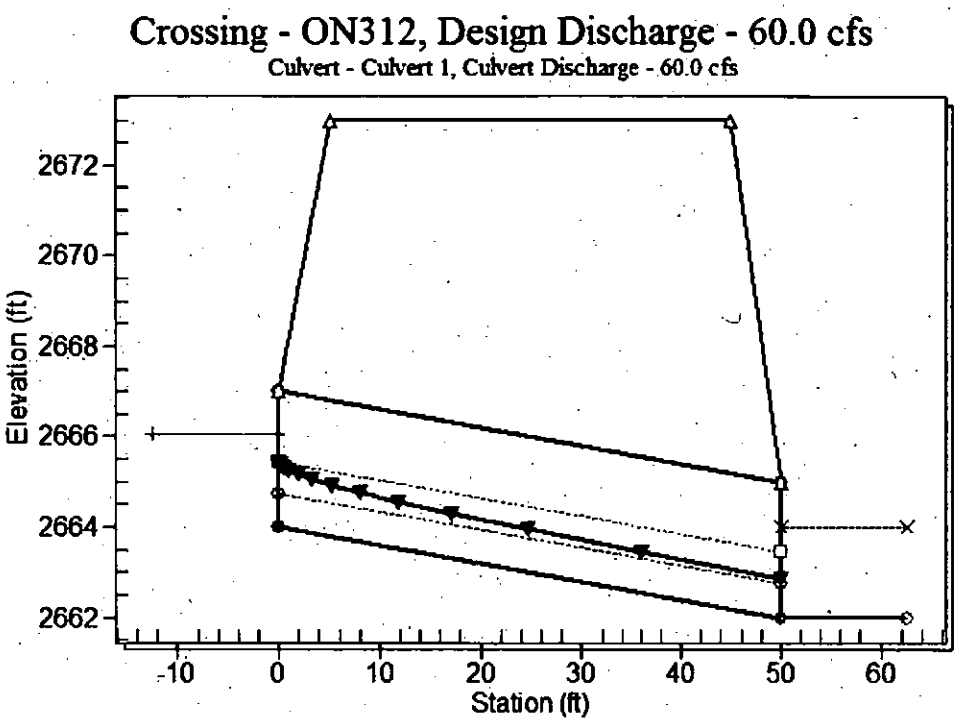
Inlet Elevation (invert): 2664.00 ft, Outlet Elevation (invert): 2662.00 ft

Culvert Length: 50.04 ft, Culvert Slope: 0.0400

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 2664.00 ft

Outlet Station: 50.00 ft

Outlet Elevation: 2662.00 ft

Number of Barrels: 3

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 18 - Downstream Channel Rating Curve (Crossing: ON312)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
21.00	2664.00	2.00
34.50	2664.00	2.00
48.00	2664.00	2.00
60.00	2664.00	2.00
75.00	2664.00	2.00
88.50	2664.00	2.00
102.00	2664.00	2.00
115.50	2664.00	2.00
129.00	2664.00	2.00
142.50	2664.00	2.00
156.00	2664.00	2.00

Tailwater Channel Data - ON312

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2664.00 ft

Roadway Data for Crossing: ON312

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2673.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-335

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 11 cfs

Design Flow: 33 cfs

Maximum Flow: 76 cfs

Table 19 - Summary of Culvert Flows at Crossing: ON335

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2706.38	11.00	11.00	0.00	1
2706.84	17.50	17.50	0.00	1
2707.25	24.00	24.00	0.00	1
2707.63	30.50	30.50	0.00	1
2707.78	33.00	33.00	0.00	1
2708.44	43.50	43.50	0.00	1
2708.91	50.00	50.00	0.00	1
2709.44	56.50	56.50	0.00	1
2710.05	63.00	63.00	0.00	1
2710.73	69.50	69.50	0.00	1
2711.48	76.00	76.00	0.00	1
2712.00	80.11	80.11	0.00	Overtopping

Rating Curve Plot for Crossing: ON335

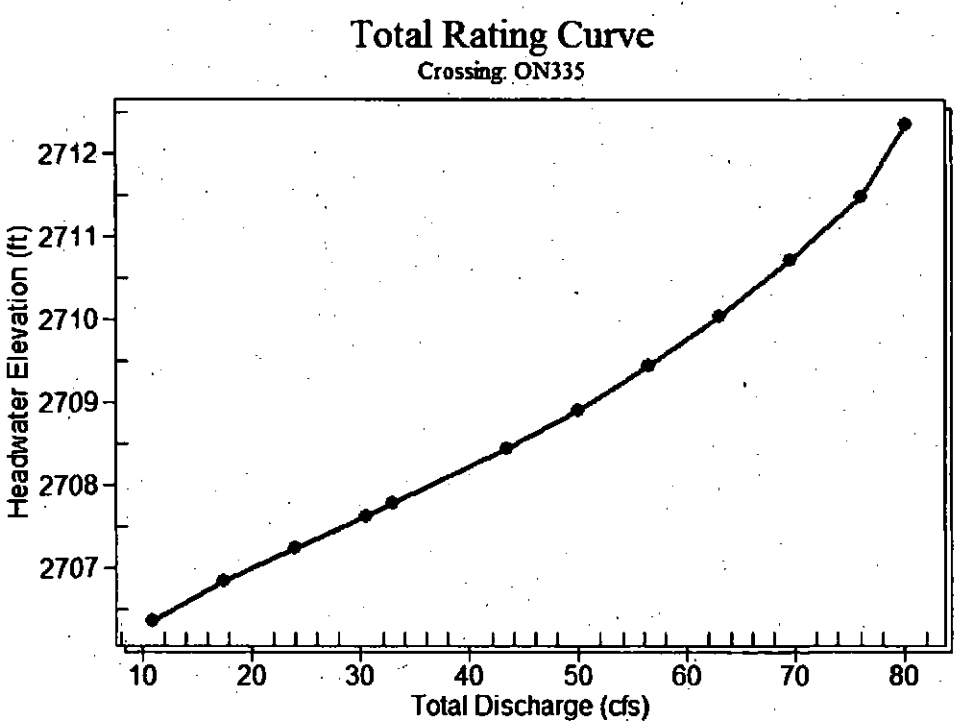


Table 20 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
11.00	11.00	2706.38	1.379	0.0*	1-JS1f	0.486	1.049	3.000	3.000	1.630	0.000
17.50	17.50	2706.84	1.842	0.0*	1-S2n	0.617	1.338	0.617	3.000	16.581	0.000
24.00	24.00	2707.25	2.255	0.0*	1-S2n	0.724	1.577	0.740	3.000	17.571	0.000
30.50	30.50	2707.63	2.635	0.0*	1-S2n	0.828	1.784	0.828	3.000	19.224	0.000
33.00	33.00	2707.78	2.781	0.0*	1-S2n	0.859	1.862	0.875	3.000	19.175	0.000
43.50	43.50	2708.44	3.437	0.0*	5-S2n	0.990	2.146	1.022	3.000	20.423	0.000
50.00	50.00	2708.91	3.906	0.0*	5-S2n	1.071	2.298	1.071	3.000	22.057	0.000
56.50	56.50	2709.44	4.440	0.0*	5-S2n	1.143	2.434	1.181	3.000	21.840	0.000
63.00	63.00	2710.05	5.046	0.0*	5-S2n	1.211	2.552	1.252	3.000	22.536	0.000
69.50	69.50	2710.73	5.728	0.0*	5-S2n	1.280	2.651	1.333	3.000	22.897	0.000
76.00	76.00	2711.48	6.484	0.0*	5-S2n	1.348	2.731	1.405	3.000	23.399	0.000

* Full Flow Headwater elevation is below inlet invert.

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Straight Culvert

Inlet Elevation (invert): 2705.00 ft, . Outlet Elevation (invert): 2691.00 ft

Culvert Length: 220.45 ft, Culvert Slope: 0.0636

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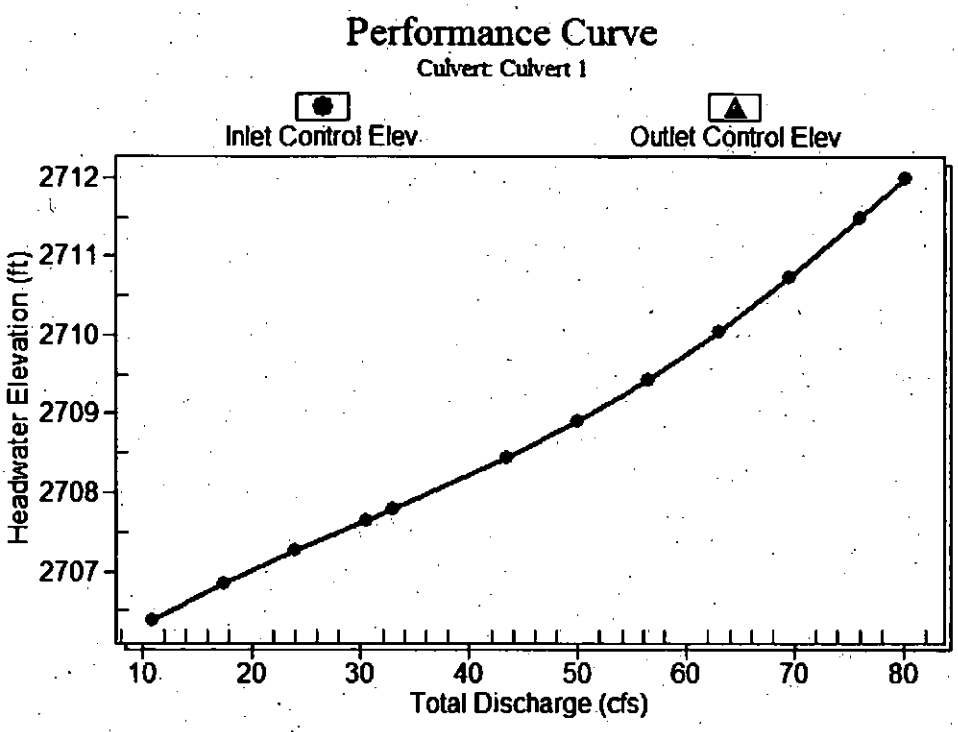
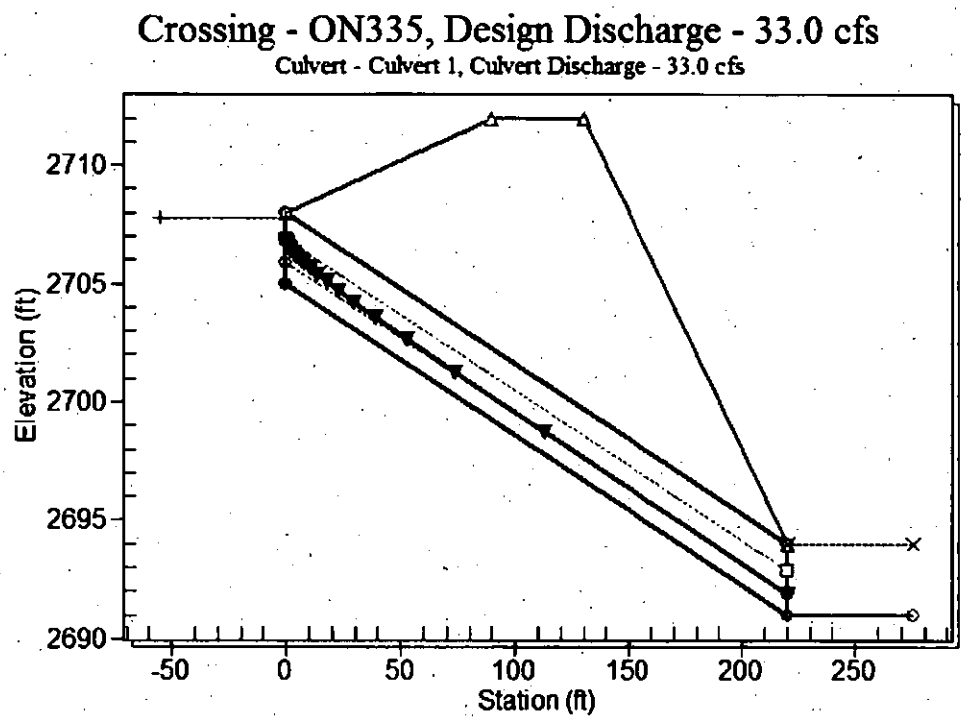
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 2705.00 ft

Outlet Station: 220.00 ft

Outlet Elevation: 2691.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 21 - Downstream Channel Rating Curve (Crossing: ON335)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
11.00	2694.00	3.00
17.50	2694.00	3.00
24.00	2694.00	3.00
30.50	2694.00	3.00
33.00	2694.00	3.00
43.50	2694.00	3.00
50.00	2694.00	3.00
56.50	2694.00	3.00
63.00	2694.00	3.00
69.50	2694.00	3.00
76.00	2694.00	3.00

Tailwater Channel Data - ON335

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2694.00 ft

Roadway Data for Crossing: ON335

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2712.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-336

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 8 cfs

Design Flow: 23 cfs

Maximum Flow: 66 cfs

Table 22 - Summary of Culvert Flows at Crossing: ON336

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2692.39	8.00	8.00	0.00	1
2693.02	13.80	13.80	0.00	1
2693.78	19.60	19.60	0.00	1
2694.03	23.00	21.14	1.70	20
2694.09	31.20	21.51	9.52	5
2694.12	37.00	21.70	15.18	4
2694.15	42.80	21.87	20.88	4
2694.18	48.60	22.01	26.42	3
2694.20	54.40	22.15	32.13	3
2694.22	60.20	22.28	37.85	3
2694.25	66.00	22.41	43.56	3
2694.00	20.97	20.97	0.00	Overtopping

Rating Curve Plot for Crossing: ON336

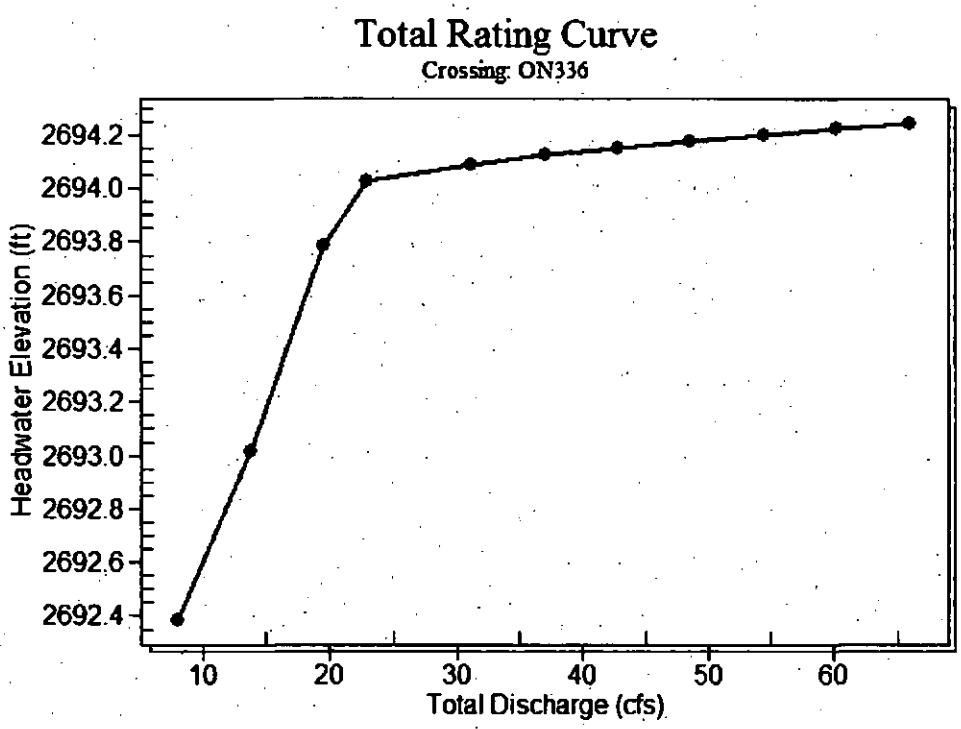


Table 23 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
8.00	8.00	2692.39	1.388	0.0*	1-S2n	0.426	1.006	0.426	-18.500	16.200	0.000
13.80	13.80	2693.02	2.019	0.0*	5-S2n	0.568	1.334	0.630	-18.500	16.202	0.000
19.60	19.60	2693.78	2.782	0.0*	5-S2n	0.682	1.589	0.779	-18.500	17.275	0.000
23.00	21.14	2694.03	3.028	0.0*	5-S2n	0.712	1.645	0.817	-18.500	17.496	0.000
31.20	21.51	2694.09	3.090	0.0*	5-S2n	0.719	1.658	0.825	-18.500	17.562	0.000
37.00	21.70	2694.12	3.122	0.0*	5-S2n	0.723	1.664	0.830	-18.500	17.598	0.000
42.80	21.87	2694.15	3.151	0.0*	5-S2n	0.726	1.670	0.833	-18.500	17.629	0.000
48.60	22.01	2694.18	3.177	0.0*	5-S2n	0.729	1.674	0.837	-18.500	17.657	0.000
54.40	22.15	2694.20	3.201	0.0*	5-S2n	0.731	1.679	0.840	-18.500	17.684	0.000
60.20	22.28	2694.22	3.224	0.0*	5-S2n	0.733	1.683	0.842	-18.500	17.709	0.000
66.00	22.41	2694.25	3.246	0.0*	5-S2n	0.735	1.687	0.845	-18.500	17.733	0.000

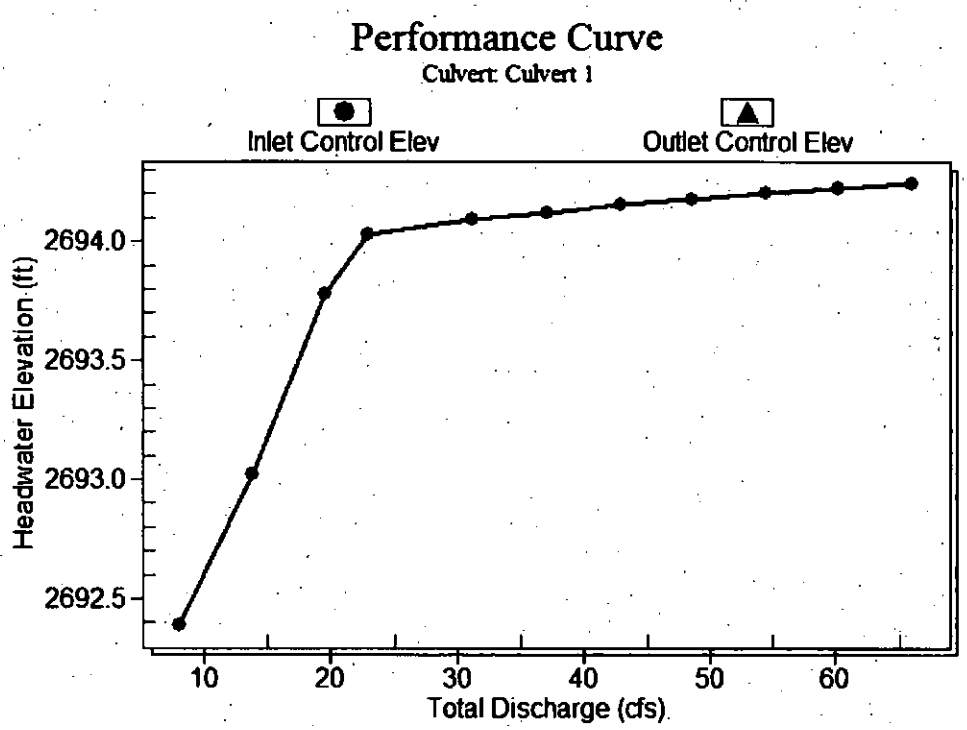
* Full Flow Headwater elevation is below inlet invert.

Straight Culvert

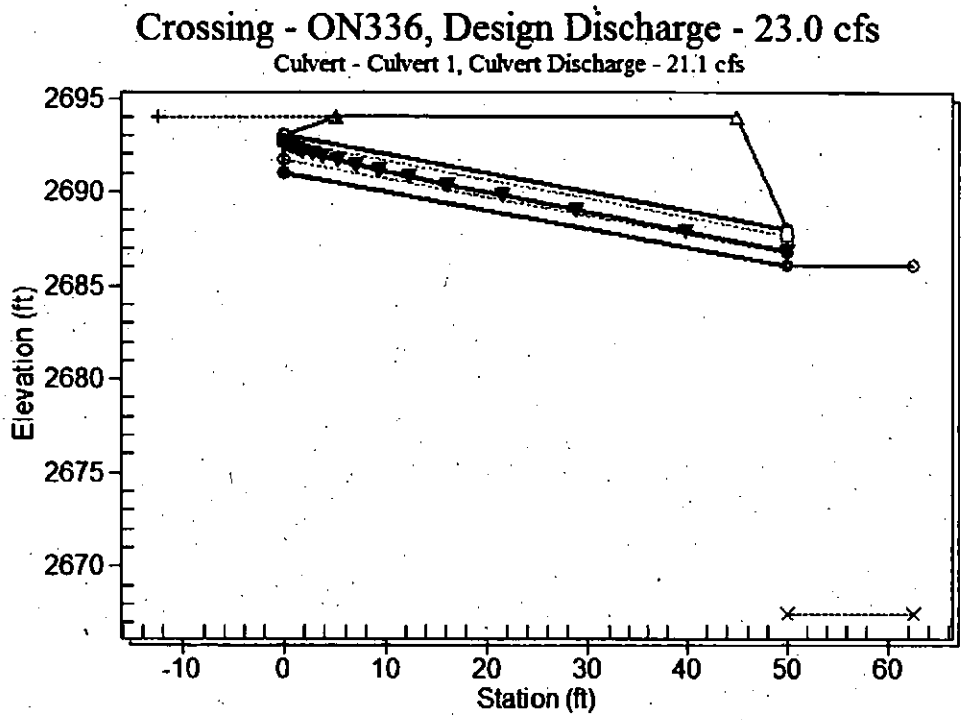
Inlet Elevation (invert): 2691.00 ft, Outlet Elevation (invert): 2686.00 ft

Culvert Length: 50.25 ft, Culvert Slope: 0.1000

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 2691.00 ft

Outlet Station: 50.00 ft

Outlet Elevation: 2686.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 24 - Downstream Channel Rating Curve (Crossing: ON336)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
8.00	2667.50	-18.50
13.80	2667.50	-18.50
19.60	2667.50	-18.50
23.00	2667.50	-18.50
31.20	2667.50	-18.50
37.00	2667.50	-18.50
42.80	2667.50	-18.50
48.60	2667.50	-18.50
54.40	2667.50	-18.50
60.20	2667.50	-18.50
66.00	2667.50	-18.50

Tailwater Channel Data - ON336

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2667.50 ft

Roadway Data for Crossing: ON336

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2694.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-336

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 10 cfs

Design Flow: 28 cfs

Maximum Flow: 75 cfs

Table 25 - Summary of Culvert Flows at Crossing: ON337

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2672.20	10.00	10.00	0.00	1
2672.57	16.50	16.50	0.00	1
2672.88	23.00	23.00	0.00	1
2673.11	28.00	28.00	0.00	1
2673.49	36.00	36.00	0.00	1
2673.76	42.50	42.50	0.00	1
2674.02	49.00	49.00	0.00	1
2674.27	55.50	55.50	0.00	1
2674.52	62.00	62.00	0.00	1
2674.76	68.50	68.50	0.00	1
2675.02	75.00	75.00	0.00	1
2676.00	97.82	97.82	0.00	Overtopping

Rating Curve Plot for Crossing: ON337

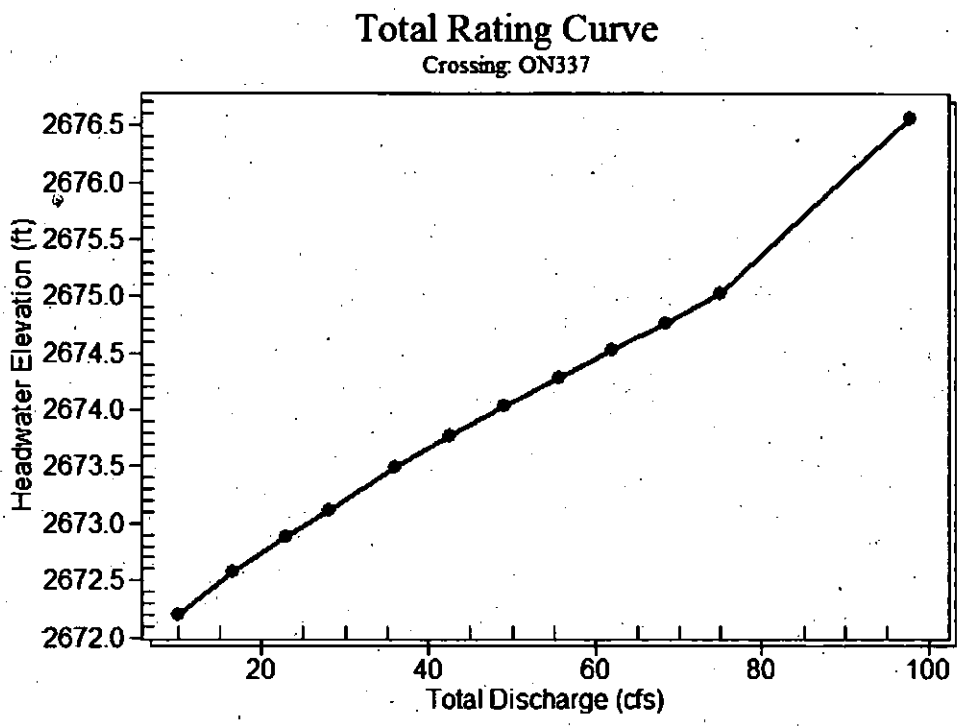


Table 26 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
10.00	10.00	2672.20	1.205	0.0*	1-S2n	0.440	0.916	0.495	1.000	10.792	0.000
16.50	16.50	2672.57	1.572	0.0*	1-S2n	0.563	1.189	0.638	1.000	12.531	0.000
23.00	23.00	2672.88	1.877	0.0*	1-S2n	0.686	1.412	0.769	1.000	13.736	0.000
28.00	28.00	2673.11	2.111	0.0*	1-S2n	0.760	1.563	0.861	1.000	13.958	0.000
36.00	36.00	2673.49	2.487	0.0*	1-S2n	0.852	1.786	0.997	1.000	14.814	0.000
42.50	42.50	2673.76	2.763	0.0*	1-S2n	0.927	1.949	1.098	1.000	15.170	0.000
49.00	49.00	2674.02	3.023	0.0*	1-S2n	1.002	2.096	1.196	1.000	15.469	0.000
55.50	55.50	2674.27	3.272	0.0*	1-S2n	1.077	2.237	1.290	1.000	15.784	0.000
62.00	62.00	2674.52	3.517	0.033	1-S2n	1.137	2.371	1.380	1.000	16.095	0.000
68.50	68.50	2674.76	3.764	0.304	1-S2n	1.194	2.496	1.467	1.000	16.400	0.000
75.00	75.00	2675.02	4.016	0.587	5-S2n	1.250	2.619	1.551	1.000	16.635	0.000

* Full Flow Headwater elevation is below inlet invert.

****

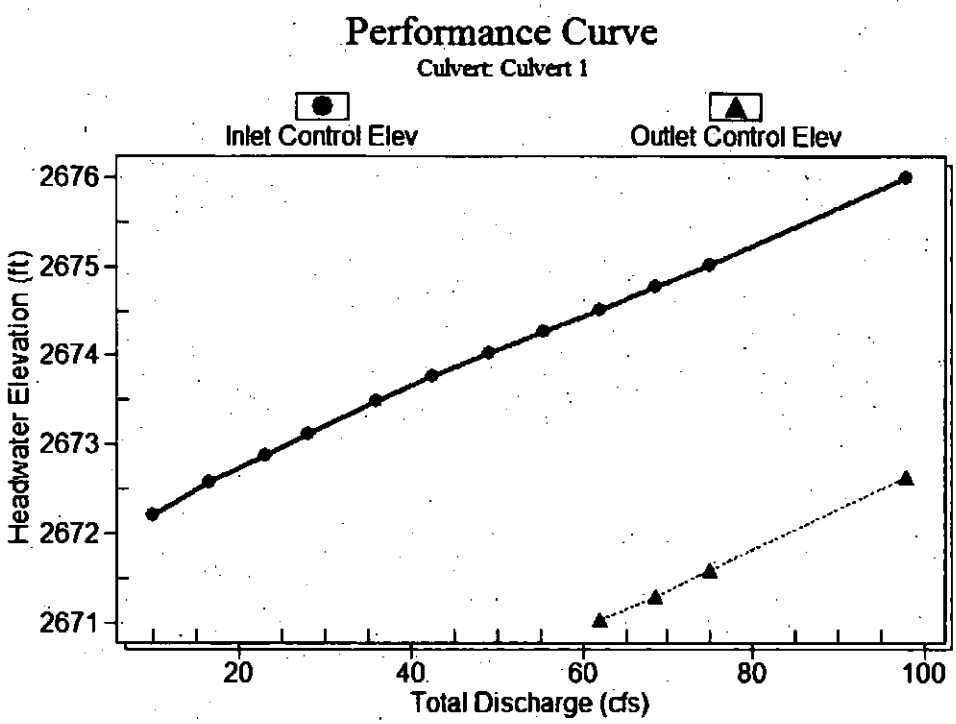
Straight Culvert

Inlet Elevation (invert): 2671.00 ft, Outlet Elevation (invert): 2666.00 ft

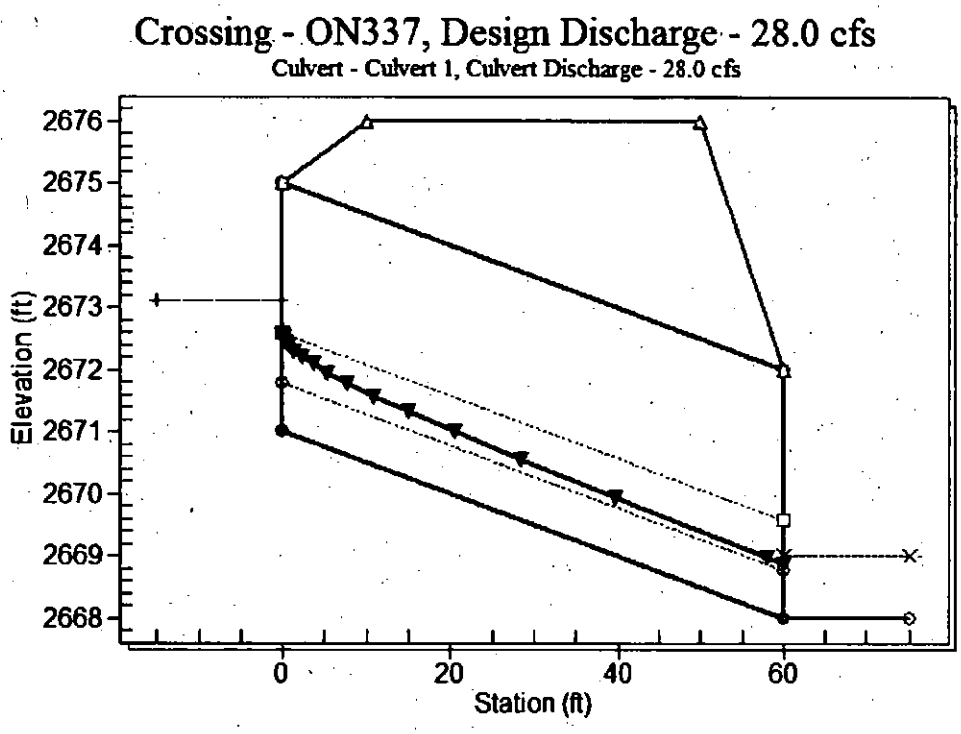
Culvert Length: 60.07 ft, Culvert Slope: 0.0500

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 2671.00 ft
Outlet Station: 60.00 ft
Outlet Elevation: 2668.00 ft
Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular
Barrel Diameter: 4.00 ft
Barrel Material: Concrete
Embedment: 0.00 in
Barrel Manning's n: 0.0120
Culvert Type: Straight
Inlet Configuration: Square Edge with Headwall
Inlet Depression: NONE

Table 27 - Downstream Channel Rating Curve (Crossing: ON337)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
10.00	2669.00	1.00
16.50	2669.00	1.00
23.00	2669.00	1.00
28.00	2669.00	1.00
36.00	2669.00	1.00
42.50	2669.00	1.00
49.00	2669.00	1.00
55.50	2669.00	1.00
62.00	2669.00	1.00
68.50	2669.00	1.00
75.00	2669.00	1.00

Tailwater Channel Data - ON337

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2669.00 ft

Roadway Data for Crossing: ON337

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2676.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

Culvert: ON-340

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 6 cfs

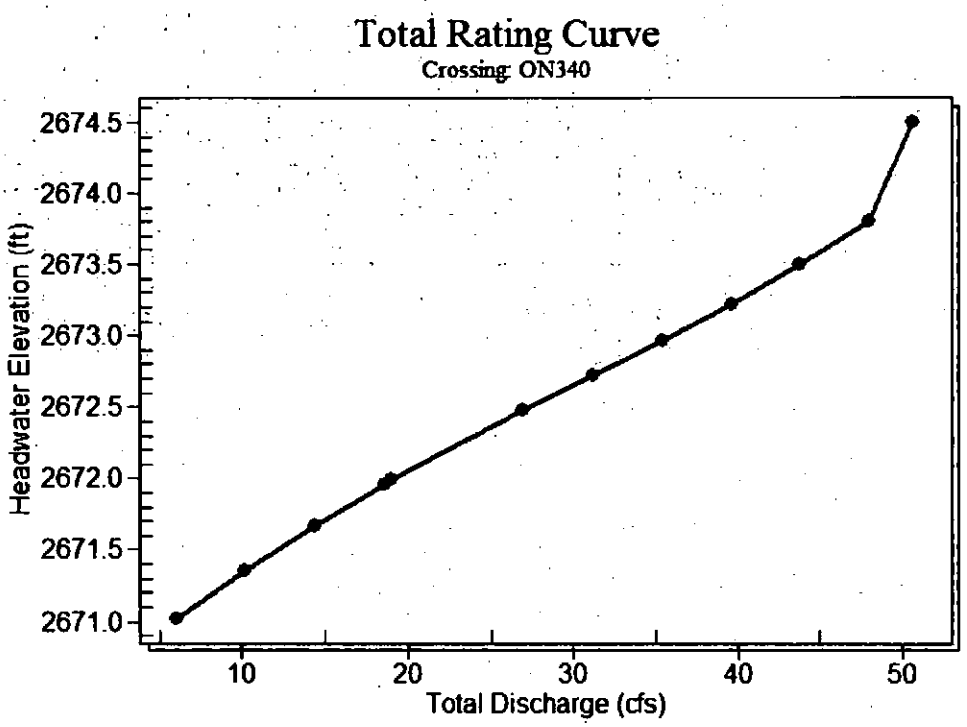
Design Flow: 19 cfs

Maximum Flow: 48 cfs

Table 28 - Summary of Culvert Flows at Crossing: ON340

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
2671.02	6.00	6.00	0.00	1
2671.36	10.20	10.20	0.00	1
2671.67	14.40	14.40	0.00	1
2671.96	18.60	18.60	0.00	1
2671.99	19.00	19.00	0.00	1
2672.48	27.00	27.00	0.00	1
2672.72	31.20	31.20	0.00	1
2672.97	35.40	35.40	0.00	1
2673.23	39.60	39.60	0.00	1
2673.50	43.80	43.80	0.00	1
2673.80	48.00	48.00	0.00	1
2674.00	50.62	50.62	0.00	Overtopping

Rating Curve Plot for Crossing: ON340



* Full Flow Headwater elevation is below inlet invert.

****

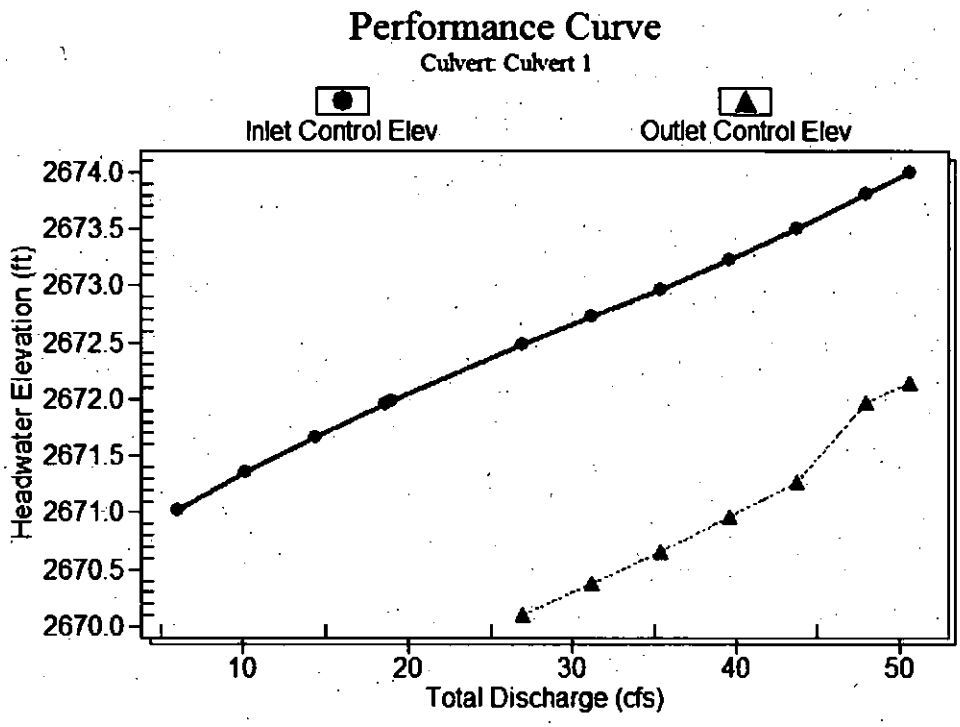
Straight Culvert

Inlet Elevation (invert): 2670.00 ft, Outlet Elevation (invert): 2668.00 ft

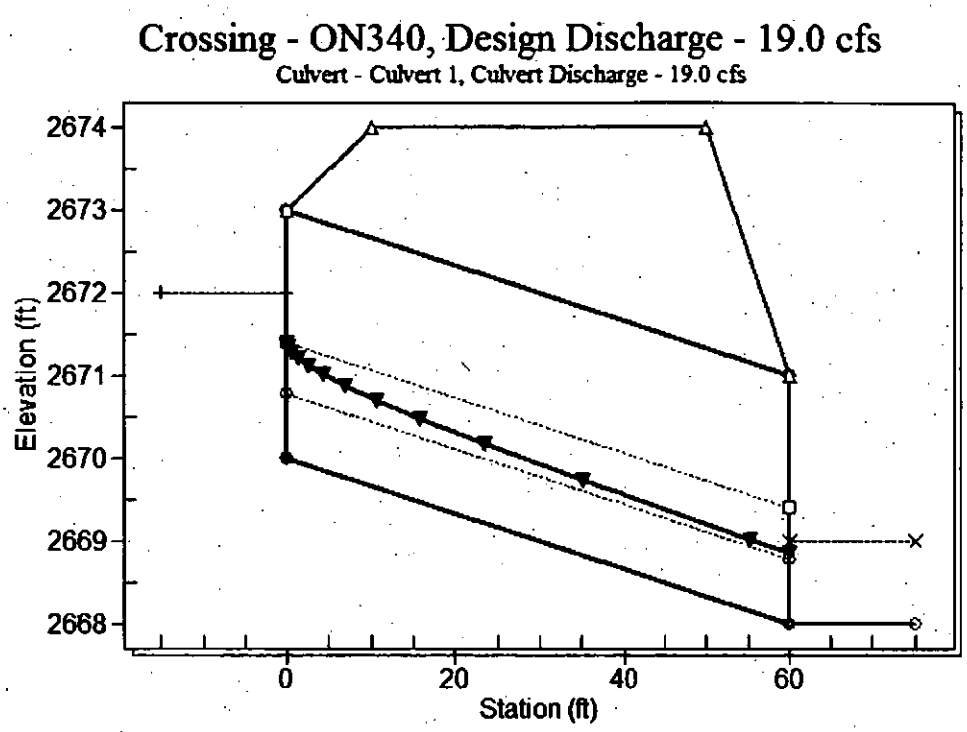
Culvert Length: 60.03 ft, Culvert Slope: 0.0333

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 ft
Inlet Elevation: 2670.00 ft
Outlet Station: 60.00 ft
Outlet Elevation: 2668.00 ft
Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular
Barrel Diameter: 3.00 ft
Barrel Material: Concrete
Embedment: 0.00 in
Barrel Manning's n: 0.0120
Culvert Type: Straight
Inlet Configuration: Square Edge with Headwall
Inlet Depression: NONE

Table 30 - Downstream Channel Rating Curve (Crossing: ON340)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
6.00	2669.00	1.00
10.20	2669.00	1.00
14.40	2669.00	1.00
18.60	2669.00	1.00
19.00	2669.00	1.00
27.00	2669.00	1.00
31.20	2669.00	1.00
35.40	2669.00	1.00
39.60	2669.00	1.00
43.80	2669.00	1.00
48.00	2669.00	1.00

Tailwater Channel Data - ON340

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 2669.00 ft

Roadway Data for Crossing: ON340

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 120.00 ft

Crest Elevation: 2674.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

First Flush Spillway/Dissipation Basin Design

Project ***Storyrock***
Subject **First Flush Spillway/Dissipation Basin Design**
Designed by **ZJH** Date 2/5/2016 Project No. 191069020
Checked by **JMB** Date 2/5/2016

Objective: Design First Flush Spillway & Dissipation Basin for Typical Area

First Flush Equivalent Design Storm: 2 Year

Q_2 = 2-8 cfs

Spillway Design:

Top Width	8 Feet
Side Slopes	4:1 H:V
Flow Depth (2 year Design Storm)	0.5 Feet
Capacity[1] (2 year Design Storm)	5 CFS

Dissipation Basin Design:

V =Spillway Velocity[1]	5.25 ft/s
D =Equivalent Opening Width	4 Feet
Riprap $D_{50} = 0.0191*V^2*(0.61)$[2]	6 Inches
Basin Length = 4xD[3]	**16 Feet**

Notes:
(1) Refer to Attached Flowmaster Output for Spillway Hydraulic Design
(2) Per Drainage Design Manual - Hydraulics Equation 6.36, Specific Weight of Stone = 165 lb/ft3
(3) Per Drainage Design Manual - Hydraulics Table 8.6

Worksheet for First Flush Spillway

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.055	
Channel Slope	0.25000	ft/ft
Normal Depth	0.50	ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	0.00	ft

Results

Discharge	5.25	ft^3/s
Flow Area	1.00	ft^2
Wetted Perimeter	4.12	ft
Hydraulic Radius	0.24	ft
Top Width	4.00	ft
Critical Depth	0.64	ft
Critical Slope	0.06711	ft/ft
Velocity	5.25	ft/s
Velocity Head	0.43	ft
Specific Energy	0.93	ft
Froude Number	1.85	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.64	ft
Channel Slope	0.25000	ft/ft

Appendix D – Stormwater Storage Waiver

Request for Stormwater Storage Waiver

City of Scottsdale Case Numbers:

___ - PA - ____ ____ - ZN - ____ ____ - UP - ____ ____ - DR - ___ ____ - PP - ____ PC#_____

The applicant/developer must complete and submit this form to the city for processing and obtain approval of waiver request ***before submitting improvement plans***. Denial of the waiver may require the developer to submit a revised site plan to the Development Review Board.

Date 10/26/2016 **Project Name** Storyrock

Project Location 128th Street and Ranch Gate Road

Applicant Contact Jason Burm, PE **Company Name** Kimley-Horn and Associates

Phone 480-207-2667 Fax _____ E-mail jason.burm@kimley-horn.com

Address 1855 W. Baseline Road, Suite 200 Mesa, AZ 85202

Waiver Criteria

A project must meet at least one of three criteria listed below for the city to consider waiving some or all required stormwater storage. **However, regardless of the criteria, a waiver will only be granted if the applicant can demonstrate that the effect of a waiver will not increase the potential for flooding on any property.** Check the applicable box and provide a signed engineering report and supporting engineering analysis that demonstrate the project meets the criteria and that the effect of a waiver will not increase the potential for flooding on any property.

If the runoff for the project has been included in a storage facility at another location, the applicant must demonstrate that the stormwater storage facility was specifically designed to accommodate runoff from the subject property and that the runoff will be conveyed to this location through an adequately designed conveyance facility.

☐ 1. The development is adjacent to a conveyance facility that an engineering analysis shows is designed and constructed to handle the additional runoff from the site as a result of development.

☐ 2. The development is on a parcel less than one-half acre in size.

☑ 3. Stormwater storage requirements conflict with requirements of the Environmentally Sensitive Lands Ordinance (ESLO).

For a full storage waiver, a conflict with ESLO is limited to:

- Property located in the hillside landform as defined in the city Zoning Ordinance
- Property in the upper desert landform that has a land slope steeper than 5% as defined in the city Zoning Ordinance
- Property within the ESL zoning overlay district where the only viable location for a stormwater storage basin requires blasting

This full waiver only applies to those portions of property meeting one of these three requirements.

Partial waivers are available for projects or portions of properties within the Environmentally Sensitive Lands Zoning Overlay District, not meeting any of the three full waiver criteria above, if post-development peak discharge rates do not exceed pre-development conditions, based on the 10- and 100-year storm events.

By signing below, I certify that the stated project meets the waiver criteria selected above as demonstrated by the attached documentation.

Engineer _____ Date 10.27.16

Planning, Neighborhood & Transportation Division

7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • Phone: 480-312-2500 • Fax: 480-312-7781

Request for Stormwater Storage Waiver

City of Scottsdale Case Numbers:

___ - PA - ____ ____ - ZN - ____ ____ - UP - ____ ____ - DR - ___ ____ - PP - ____ PC#_____

CITY STAFF TO COMPLETE THIS PAGE

Project Name _____

Check Appropriate Boxes:

☐ Meets waiver criteria (specify): ☐ 1 ☐ 2 ☐ 3

☐ Recommend approve waiver.

☐ Recommend deny waiver:
- ☐ None of waiver criteria met.
- ☐ Downstream conditions prohibit waiver of any storage.
- ☐ Other:

Explain: _____

_____

☐ Return waiver request:
- ☐ Insufficient data provided.
- ☐ Other: _____

Explain: _____

_____

Recommended Conditions of Waiver:
- ☐ All storage requirements waived.
- ☐ Post-development peak discharge rates do not exceed pre-development conditions.
- ☐ Other:

Explain: _____

_____

☐ **Waiver approved per above conditions.**

☐ **Waiver denied.**

_____ _____

Floodplain Administrator or Designee Date

Planning, Neighborhood & Transportation Division

7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • Phone: 480-312-2500 • Fax: 480-312-7781

Request for Stormwater Storage Waiver

City of Scottsdale Case Numbers:

___ - PA - ____ ____ - ZN - ____ ____ - UP - ____ ____ - DR - ___ ____ - PP - ____ PC#_____

In-Lieu Fee and In-Kind Contributions

In-lieu fees are only applicable to projects where post-development peak discharge rates exceed pre-development levels, based on the 10- and 100-year storm events. If the city grants a waiver, the developer is required to calculate and contribute an in-lieu fee based on what it would cost the city to provide a storage basin, sized as described below, including costs such as land acquisition, construction, landscaping, design, construction management, and maintenance over a 75-year design life. The fee for this cost is $1.87 per cubic foot of stormwater storage for a virtual storage basin designed to mitigate the increase in runoff associated with the 100-year/2-hour storm event. The applicant may submit site-specific in-lieu fee calculations subject to the Floodplain Administrator's approval.

The Floodplain Administrator considers in-kind contributions on a case-by-case basis. An in-kind contribution can serve as part of or instead of the calculated in-lieu fee. In-kind contributions must be stormwater related and must constitute a public benefit. In-lieu fees and in-kind contributions are subject to the approval of the Floodplain Administrator or designee.

Project Name STORYROCK

The waived stormwater storage volume is calculated using a simplified approach as follows:

$V = \Delta CRA$; where

V = stormwater storage volume required, in cubic feet,
ΔC = increase in weighted average runoff coefficient over disturbed area ($C_{post} - C_{pre}$),
R = 100-year/2-hour precipitation depth, in feet (DSPM, Appendix 4-1D, page 11), and
A = area of disturbed ground, in square feet

Furthermore,

$V_w = V - V_p$; where
V_w = volume waived,
V = volume required, and
V_p = volume provided

R = _____
ΔC= _____
A = _____
V = _____
V_p= _____
V_w= _____

☐ An in-lieu fee will be paid, based on the following calculations and supporting documentation:
In-lieu fee ($) = V_w (cu. ft.) x $1.87 per cubic foot = _____

☐ An in-kind contribution will be made, as follows:

_____
_____
_____

☐ No in-lieu fee is required. Reason:

_____
_____

Approved by:

_____ _____
Floodplain Administrator or Designee Date

Planning, Neighborhood & Transportation Division
7447 E Indian School Road, Suite 105, Scottsdale, AZ 85251 • Phone: 480-312-2500 • Fax: 480-312-7781

Appendix E – Preliminary Grading Plan