



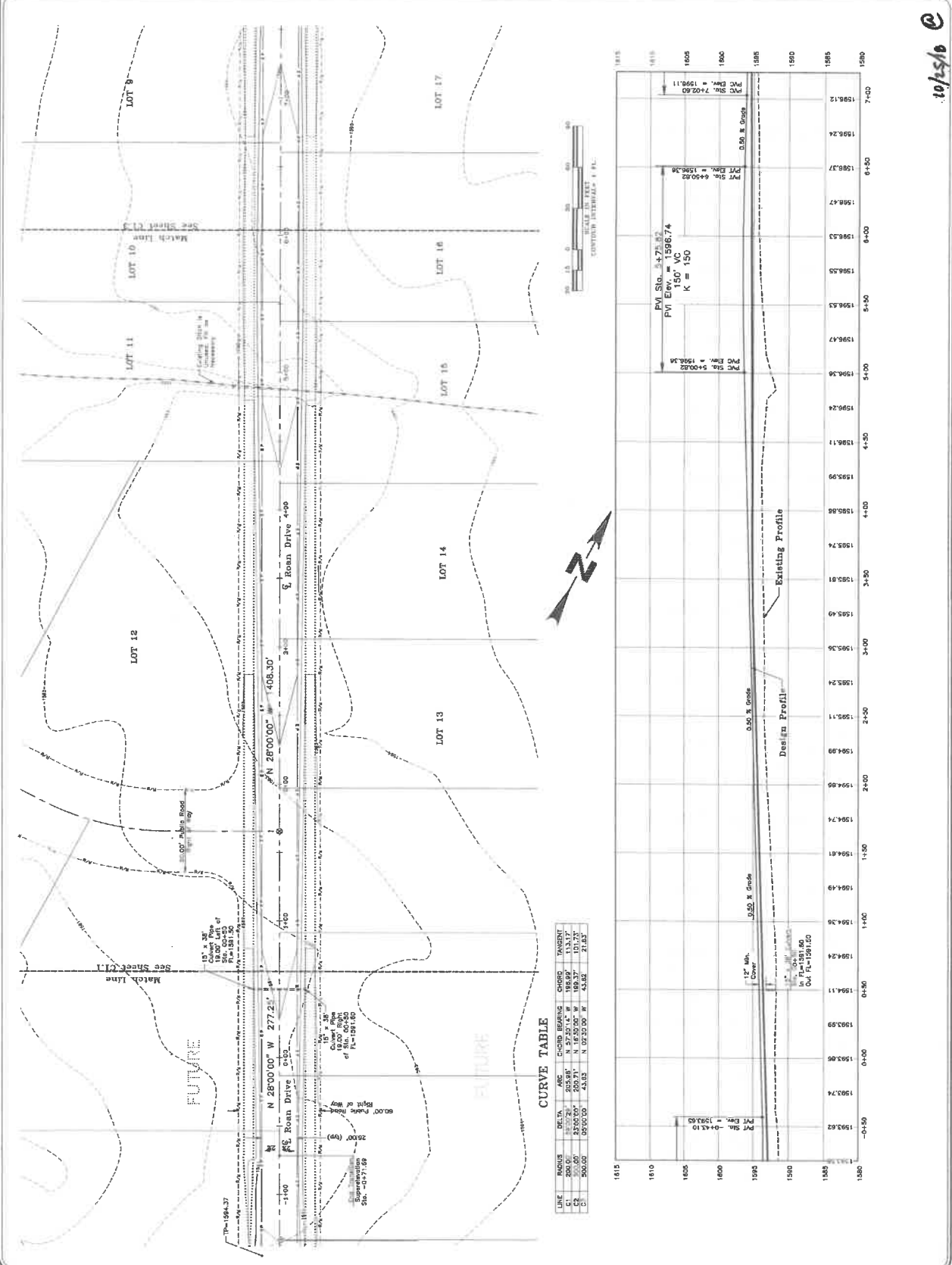
WESTERN PACIFIC
ENGINEERING & SURVEY
A TERA DEVELOPMENT SERVICES CORPORATION
14509782-1023 P (509)745-1288
1320 E. Riverside Drive, Suite 100A, Wallingford, WA 98604

No.	Revision	Date	By

Palomino County
LCU, INC.
PALOMINO MAJOR PLAT, PHASE 3
ROAD DRIVE IMPROVEMENTS
Plan and Profile Sta. -1+00 to Sta. 7+00

Designed by: NHT
Drawn by: Tom/AG
Checked by: NDB
Project No.: 1813
Sheet No.: October 2010
Scale: 1" = 30'
Sta. 27, 18, N, B, E

SHEET NO.
C1.2
181827



CURVE TABLE

LINE	RADIUS	DELTA	ARC	CHORD BEARING	CHORD	TANGENT
C1	2000.0'	27.21°	203.88'	N 27.21° E	198.99'	113.17'
C2	5000.0'	32.00°	200.71'	N 18.00° W	180.30'	101.73'
C3	2000.0'	27.21°	203.88'	N 27.21° W	198.99'	113.17'

10/25/10



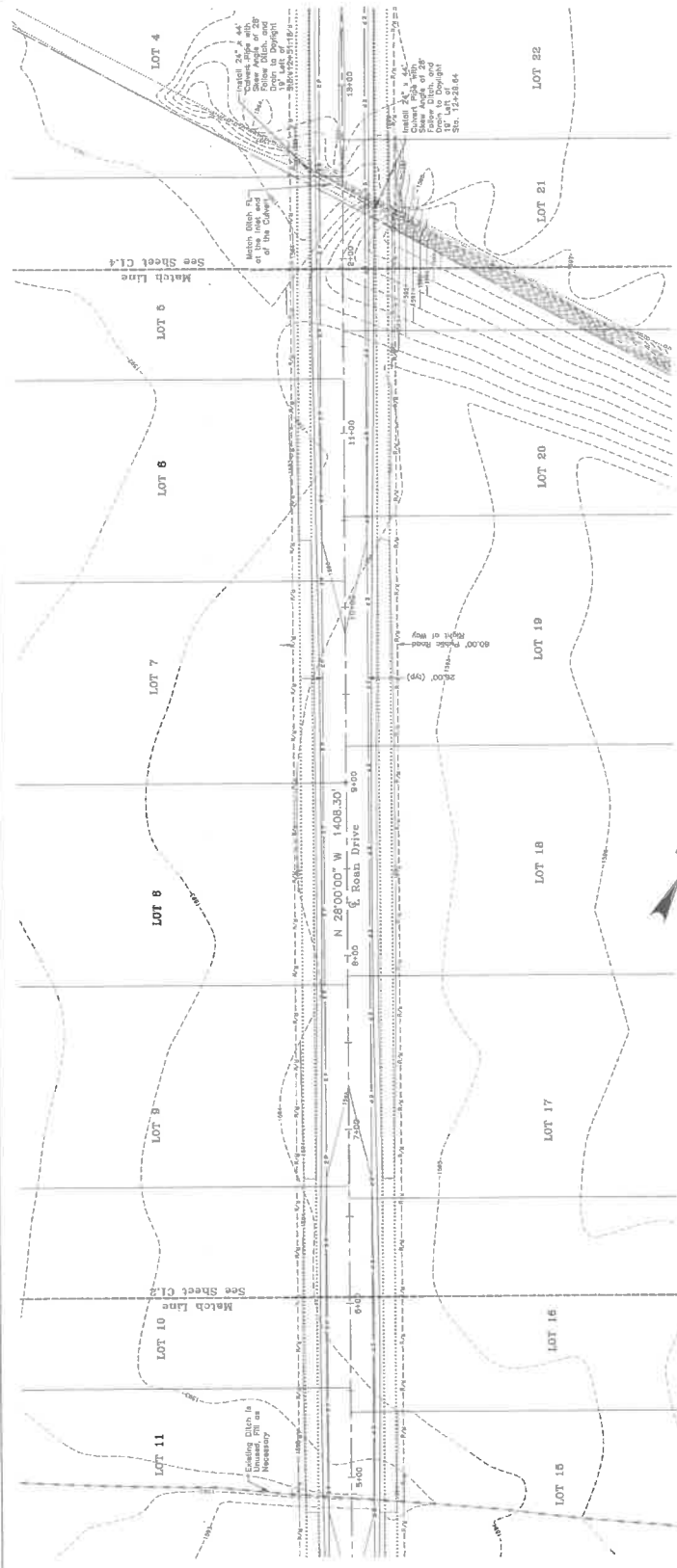
**WESTERN PACIFIC
ENGINEERING & SURVEY**
A TRSRA DEVELOPMENT SERVICES CORPORATION
1320 E. Harbor Place, Suite 1000, Washington
WA 98122 (206) 465-1288
Licensed in Washington and Idaho

No.	Revision	Date	By

LCU, INC.
PALOMINO MAJOR PLAT, PHASE 3
ROAD DRIVE IMPROVEMENTS
Plan and Profile Sta. 4+75 to Sta. 12+50
King County, Washington

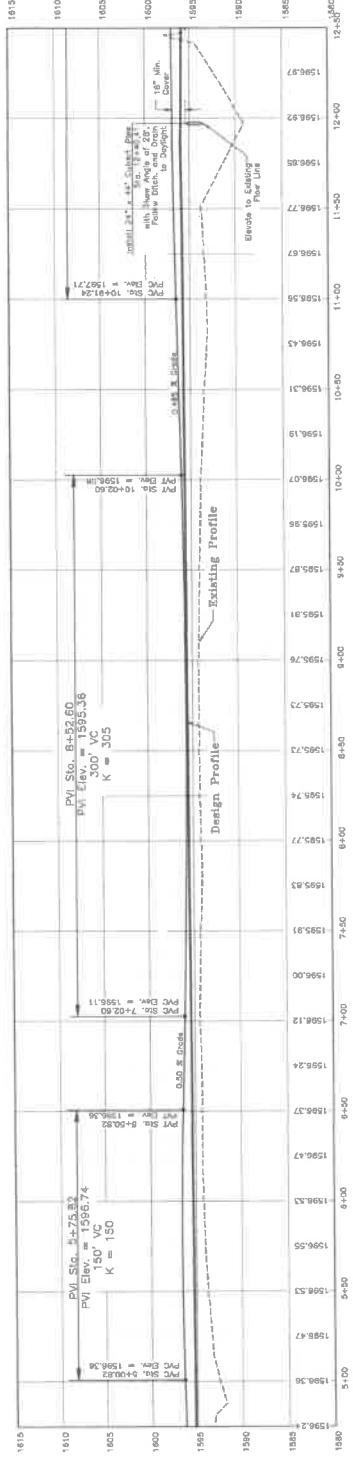
Designed by: NDN
Drawn by: TML/JAG
Checked by: NDN
Date: October 2018
Scale: 1" = 40'
Sheet: 1 of 8
See P.L. 18 N. 18 R. 2

**SHEET NO.
C1.9**
181827



CURVE TABLE

TYPE	BLK/ST	CH/ST	PC	PT	CS	CH/ST	PC	PT	CS	CH/ST	PC	PT	CS	CH/ST	PC	PT	CS
CL	200.00	26.00	205.58	188.89	153.17	118.89	188.89	205.58	26.00	200.00	26.00	205.58	188.89	153.17	118.89	188.89	205.58
CL	500.00	23.00	205.51	188.87	153.17	118.89	188.87	205.51	23.00	500.00	23.00	205.51	188.87	153.17	118.89	188.87	205.51
CL	800.00	15.00	205.50	188.85	153.17	118.89	188.85	15.00	800.00	15.00	205.50	188.85	153.17	118.89	188.85	15.00	800.00



10/26/18

181827 - Project Name: Palomino Major Plat, Phase 3 - Road Drive Improvements - Stationing 4+75 to 12+50



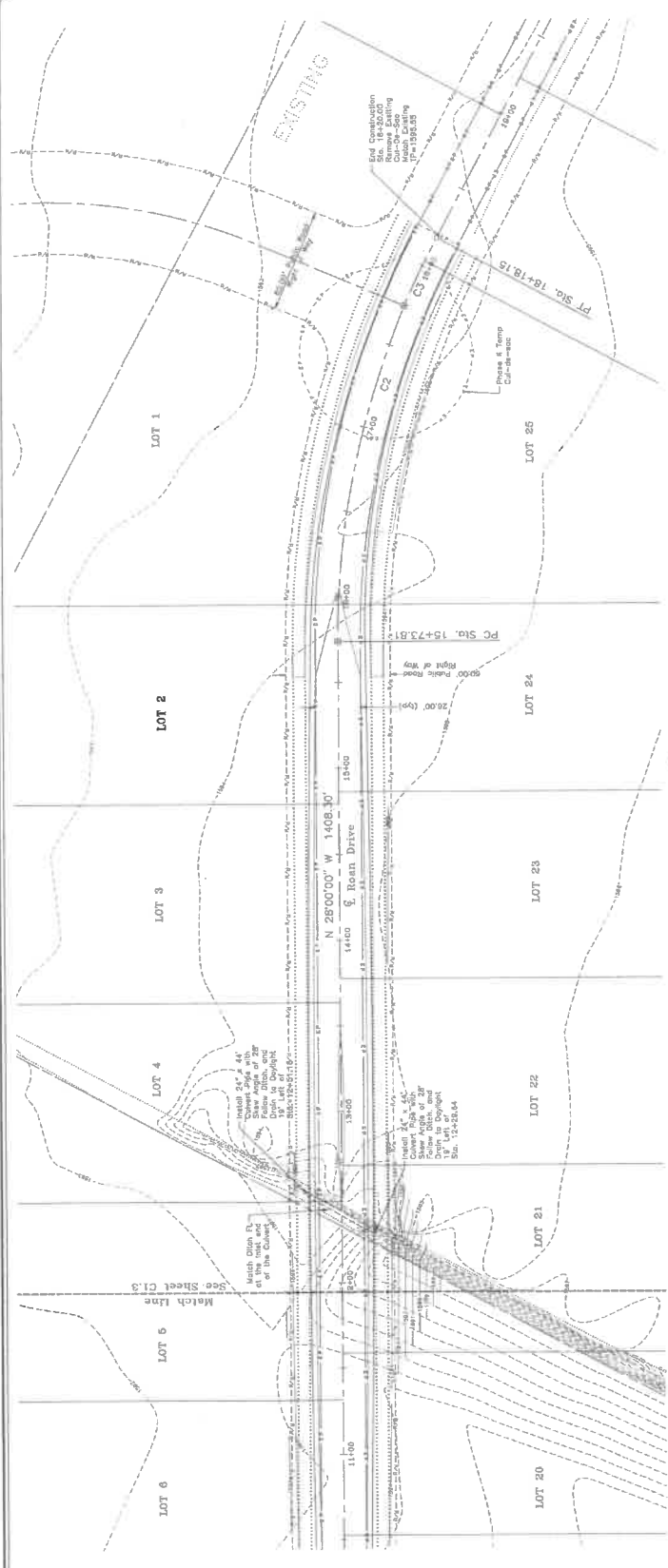
WESTERN PACIFIC
ENGINEERING & SURVEY
 A TERRA DEVELOPMENT SERVICES CORPORATION
 1329 E. Hunter Place, Moses Lake, Washington
 1(509)765-1323 FAX(509)765-1288

No.	Revisions	Date	By

LCU, INC.
PALMINO MAJOR PLAT, PHASE 3
ROAN DRIVE IMPROVEMENTS
Plan and Profile Sta. 10+75 to Sta. 18+50

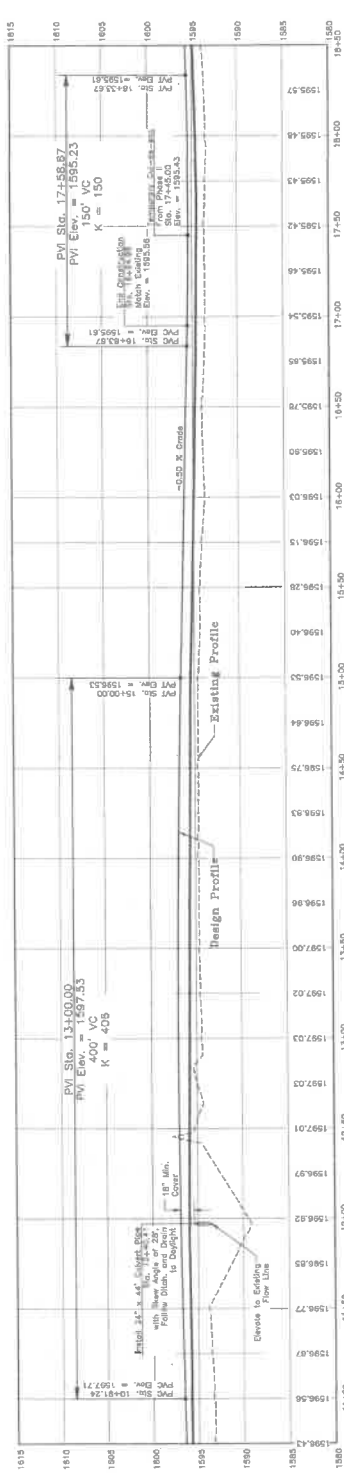
Designed by: NDN
 Drawn by: JAG
 Checked by: JAG
 Date: October 2018
 Scale: 1" = 30'
 VERT. 1" = 6'

SHEET NO. C1.4
 181827



CURVE TABLE

LINE	STATION	CHORD BEARING	CHORD	TANGENT
C1	11+00.00	N. 27°20'14" W	198.88	133.17
C2	12+00.00	N. 15°25'50" W	189.35	101.32
C3	13+00.00	N. 06°03'58" W	158.88	81.88



10/25/18



WESTERN PACIFIC
ENGINEERING & SURVEY
1223 E. Hunter Place, Mount Rainier, WA 98271
P: (509) 765-1023 F: (509) 765-1238

No.	Revised	Date	By

ICU, INC.
PALOMINO MAJOR PLAT, PHASE 3
Best Management Practices
Plan and Specifications
Kittitas County Washington

DESIGNED BY: NOK
DRAWN BY: Tim/AC
CHECKED BY: RDN
DATE: 10/20/2018
SCALE: 1" = 40'
SHEET NO. C3.1
161627



NOTES:

- 1. Mark Clearing Limits
To protect and define the area of soil exposed in construction, the limits of construction shall be clearly marked before any disturbing activities begin. In addition, the limits shall be clearly marked with the BMPs required to mark the clearing limits. The BMPs required for this project include:
- High Visibility Plastic or Metal Fence (BMP C108)
- High Visibility Plastic or Metal Fence (BMP C109)
- 2. Erosion Control
Construction access or activities occurring on exposed areas shall be stabilized, wet weather runoff shall be controlled, and wheel washing, street sweeping, and street cleaning shall be performed. The BMPs required for this project include:
- Wheel Washing (BMP C110) - High Visibility Plastic or Metal Fence (BMP C108)
- Street Sweeping (BMP C111)
- Street Cleaning (BMP C112)
- 3. Sediment Control
Due to all stormwater runoff being retained on site, there will be no flow control required.
4. Sediment Control
All sediment runoff from disturbed areas shall pass through an appropriate sediment trap or filter. The BMPs required for this project include:
- Sediment Trap (BMP C113)
- Sediment Filter (BMP C114)
- Sediment Control (BMP C115)
- 5. Stormwater Control
Stormwater runoff shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for this project include:
- Mulching (BMP C116) - High Visibility Plastic or Metal Fence (BMP C108)
- Erosion Control (BMP C117)
- 6. Erosion Control
All cut and fill slopes will be designed, constructed and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:
- Temporary and Permanent Seeding (BMP C118)
- Plastic Covering (BMP C119)
- Planting (BMP C120)
- Stabilization (BMP C121)
- Erosion Control (BMP C122)
In general, cut and fill slopes shall be stabilized as soon as possible and shall be protected with erosion control measures. The BMPs required for this project include:
- Mulching (BMP C116) - High Visibility Plastic or Metal Fence (BMP C108)
- Erosion Control (BMP C117)

SCALE IN FEET
100 50 0 100 200 300
CONTOUR INTERVALS 1 FT.

PROJECT BLOBS
All cut and fill slopes will be designed, constructed and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:
- Temporary and Permanent Seeding (BMP C118)
- Plastic Covering (BMP C119)
- Planting (BMP C120)
- Stabilization (BMP C121)
- Erosion Control (BMP C122)
In general, cut and fill slopes shall be stabilized as soon as possible and shall be protected with erosion control measures. The BMPs required for this project include:
- Mulching (BMP C116) - High Visibility Plastic or Metal Fence (BMP C108)
- Erosion Control (BMP C117)

CONTRACTOR'S OBLIGATION
The contractor shall be responsible for the implementation and maintenance of all BMPs required for this project. The contractor shall be responsible for the implementation and maintenance of all BMPs required for this project. The contractor shall be responsible for the implementation and maintenance of all BMPs required for this project.

10/20/18

PRIVATE ROAD NETWORK DRAWINGS FOR PALOMINO MAJOR PLAT, PHASE II

Prepared By

WESTERN PACIFIC ENGINEERING & SURVEY

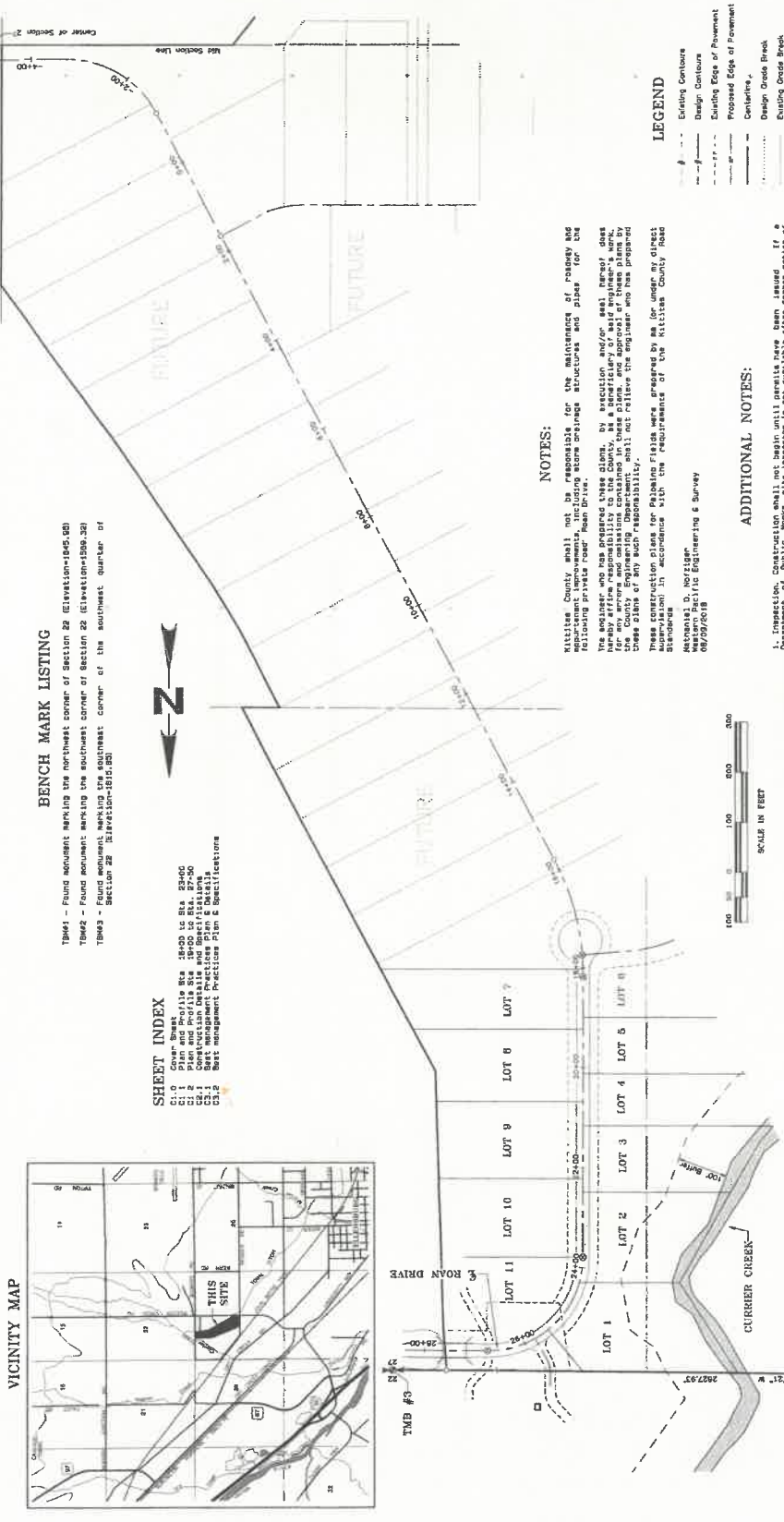


WESTERN PACIFIC
ENGINEERING & SURVEY
1528 E. HUNTER PLACE, WAUSAU, WISCONSIN
TEL: (920) 755-1023 FAX: (920) 755-1238

No.	Revision	Date	By
01	County Review	08/18/18	KDM
02	County Review - 2	08/18/18	KDM

LCU, INC.
PALOMINO MAJOR PLAT, PHASE II
Cover Sheet

Designed by: NDM
Drawn by: NDM/ABC
Checked by: NDM/ABC
Project No.: 18112
Date: July 2018
Scale: 1" = 100'
Sheet No.: C1.0
181827



VICINITY MAP



SHEET INDEX

- C1.0 Cover Sheet
- C1.1 Plan and Profile
- C1.2 Plan and Profile
- CS.1 Construction Details and Specifications
- CS.2 Best Management Practices Plan & Specifications

BENCH MARK LISTING

- TBM#1 - Found monument marking the northwest corner of Section 22 (Elevation=195.00)
- TBM#2 - Found monument marking the southwest corner of Section 22 (Elevation=199.32)
- TBM#3 - Found monument marking the southwest corner of the southeast quarter of Section 22 (Elevation=195.00)

NOTES:

Kittitas County shall not be responsible for the maintenance of roadway and following private road 'Roan Drive'. The engineer who has prepared these plans, by execution and/or seal hereof, does not warrant that the information contained in these plans and specifications is true and correct for any errors and omissions contained in these plans and specifications. The County Engineering Department shall not relieve the engineer who has prepared these plans and specifications from the responsibility which was assigned by the County Board of Supervisors in accordance with the requirements of the Kittitas County Road Standards.

ADDITIONAL NOTES:

1. Inspection, construction shall not begin until permits have been issued. If a construction activity has been provided, the permits may commence work in the improvement project. The engineer shall not accept the improvement until the improvement is complete.
2. Permit shall not start until the site design is accepted by the County Engineer.
3. All lot areas shall be based on the latest available data unless otherwise noted. Kittitas County Road Standards Chapter 5 Page 26 (02/2018).
4. All elevations are on UMDS datum with date. Point monument shall be shown on construction location plans.
5. Except where otherwise provided for, in these plans and specifications, the most current editions of the WDOT Standard Specifications and WSDOT Standard Plans shall apply.

LEGEND

- Existing Contours
- - - Existing Edge of Pavement
- - - Proposed Edge of Pavement
- - - Centerline
- - - Design Grade Break
- - - Existing Grade Break
- - - Existing Parcel Line
- - - Top of Pavement
- o Calculated Point
- o Monument to be installed by Contractor and furnished by Surveyor's Bireto Points



These plans have been reviewed by Kittitas County Department of Public Works and have been accepted for complying with the requirements of Kittitas County Road Standards

M. K. [Signature]
County Engineer
Date: 08-28-2018



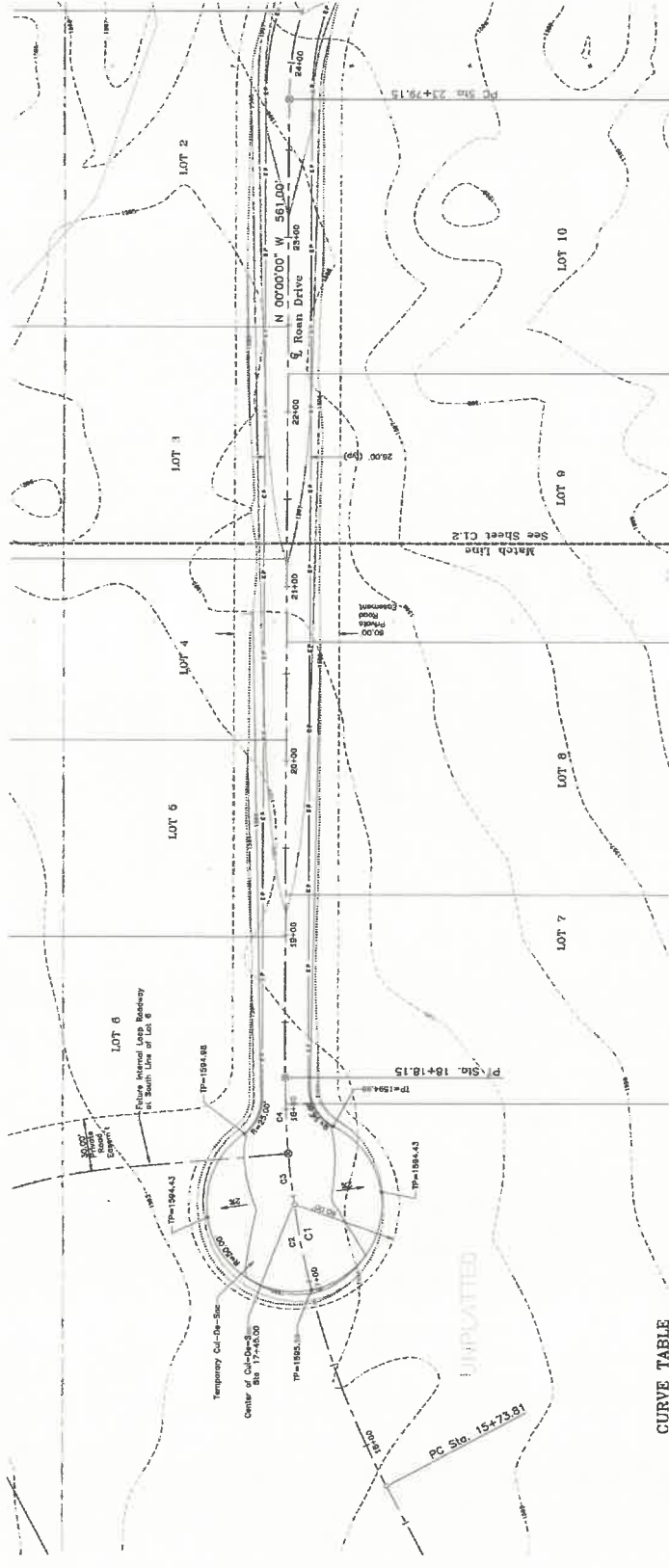
WESTERN PACIFIC
ENGINEERING & SURVEY
A TRUST DEVELOPMENT SERVICES CORPORATION
1322 E. Market Place, Moses Lake, Washington
509-765-1221 Fax: 509-765-1228

No.	Revision	Date	By
01	County Review	08/18/18	NM
02	County Review - 2	08/18/18	NM

LCU, INC.
PALOMINO MAJOR PLAT, PHASE 2
ROAD DRIVE IMPROVEMENTS
Plan and Profile Sta. 16+00 to Sta. 23+00
Wahkiakum County

Designed by: NEM
Drawn by: TM/NDN
Checked by: NEM
Date: April 2018
Scale: 1" = 40'
Sheet: 1 of 8
Sht. 27, T 18 N, R 10 E

SHEET NO. **C1.1**
181887



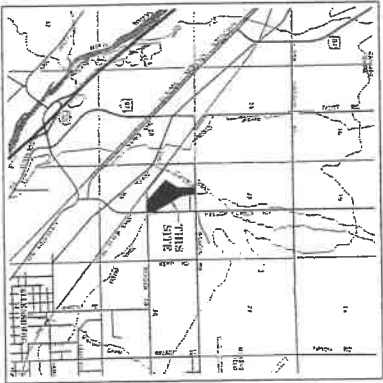
CURVE TABLE

LINE	DELTA	MINOR	ARC	CURVED	BEARING	CHORD	TANGENT
C1	17.00	1594.88	17.00	1594.88	1594.88	17.00	1594.88
C2	17.00	1594.43	17.00	1594.43	1594.43	17.00	1594.43
C3	17.00	1594.00	17.00	1594.00	1594.00	17.00	1594.00
C4	17.00	1593.57	17.00	1593.57	1593.57	17.00	1593.57
C5	17.00	1593.14	17.00	1593.14	1593.14	17.00	1593.14
C6	17.00	1592.71	17.00	1592.71	1592.71	17.00	1592.71
C7	17.00	1592.28	17.00	1592.28	1592.28	17.00	1592.28
C8	17.00	1591.85	17.00	1591.85	1591.85	17.00	1591.85
C9	17.00	1591.42	17.00	1591.42	1591.42	17.00	1591.42
C10	17.00	1590.99	17.00	1590.99	1590.99	17.00	1590.99
C11	17.00	1590.56	17.00	1590.56	1590.56	17.00	1590.56
C12	17.00	1590.13	17.00	1590.13	1590.13	17.00	1590.13
C13	17.00	1589.70	17.00	1589.70	1589.70	17.00	1589.70
C14	17.00	1589.27	17.00	1589.27	1589.27	17.00	1589.27
C15	17.00	1588.84	17.00	1588.84	1588.84	17.00	1588.84
C16	17.00	1588.41	17.00	1588.41	1588.41	17.00	1588.41
C17	17.00	1587.98	17.00	1587.98	1587.98	17.00	1587.98
C18	17.00	1587.55	17.00	1587.55	1587.55	17.00	1587.55
C19	17.00	1587.12	17.00	1587.12	1587.12	17.00	1587.12
C20	17.00	1586.69	17.00	1586.69	1586.69	17.00	1586.69
C21	17.00	1586.26	17.00	1586.26	1586.26	17.00	1586.26
C22	17.00	1585.83	17.00	1585.83	1585.83	17.00	1585.83
C23	17.00	1585.40	17.00	1585.40	1585.40	17.00	1585.40
C24	17.00	1584.97	17.00	1584.97	1584.97	17.00	1584.97
C25	17.00	1584.54	17.00	1584.54	1584.54	17.00	1584.54
C26	17.00	1584.11	17.00	1584.11	1584.11	17.00	1584.11
C27	17.00	1583.68	17.00	1583.68	1583.68	17.00	1583.68
C28	17.00	1583.25	17.00	1583.25	1583.25	17.00	1583.25
C29	17.00	1582.82	17.00	1582.82	1582.82	17.00	1582.82
C30	17.00	1582.39	17.00	1582.39	1582.39	17.00	1582.39
C31	17.00	1581.96	17.00	1581.96	1581.96	17.00	1581.96
C32	17.00	1581.53	17.00	1581.53	1581.53	17.00	1581.53
C33	17.00	1581.10	17.00	1581.10	1581.10	17.00	1581.10
C34	17.00	1580.67	17.00	1580.67	1580.67	17.00	1580.67
C35	17.00	1580.24	17.00	1580.24	1580.24	17.00	1580.24
C36	17.00	1579.81	17.00	1579.81	1579.81	17.00	1579.81
C37	17.00	1579.38	17.00	1579.38	1579.38	17.00	1579.38
C38	17.00	1578.95	17.00	1578.95	1578.95	17.00	1578.95
C39	17.00	1578.52	17.00	1578.52	1578.52	17.00	1578.52
C40	17.00	1578.09	17.00	1578.09	1578.09	17.00	1578.09
C41	17.00	1577.66	17.00	1577.66	1577.66	17.00	1577.66
C42	17.00	1577.23	17.00	1577.23	1577.23	17.00	1577.23
C43	17.00	1576.80	17.00	1576.80	1576.80	17.00	1576.80
C44	17.00	1576.37	17.00	1576.37	1576.37	17.00	1576.37
C45	17.00	1575.94	17.00	1575.94	1575.94	17.00	1575.94
C46	17.00	1575.51	17.00	1575.51	1575.51	17.00	1575.51
C47	17.00	1575.08	17.00	1575.08	1575.08	17.00	1575.08
C48	17.00	1574.65	17.00	1574.65	1574.65	17.00	1574.65
C49	17.00	1574.22	17.00	1574.22	1574.22	17.00	1574.22
C50	17.00	1573.79	17.00	1573.79	1573.79	17.00	1573.79
C51	17.00	1573.36	17.00	1573.36	1573.36	17.00	1573.36
C52	17.00	1572.93	17.00	1572.93	1572.93	17.00	1572.93
C53	17.00	1572.50	17.00	1572.50	1572.50	17.00	1572.50
C54	17.00	1572.07	17.00	1572.07	1572.07	17.00	1572.07
C55	17.00	1571.64	17.00	1571.64	1571.64	17.00	1571.64
C56	17.00	1571.21	17.00	1571.21	1571.21	17.00	1571.21
C57	17.00	1570.78	17.00	1570.78	1570.78	17.00	1570.78
C58	17.00	1570.35	17.00	1570.35	1570.35	17.00	1570.35
C59	17.00	1569.92	17.00	1569.92	1569.92	17.00	1569.92
C60	17.00	1569.49	17.00	1569.49	1569.49	17.00	1569.49
C61	17.00	1569.06	17.00	1569.06	1569.06	17.00	1569.06
C62	17.00	1568.63	17.00	1568.63	1568.63	17.00	1568.63
C63	17.00	1568.20	17.00	1568.20	1568.20	17.00	1568.20
C64	17.00	1567.77	17.00	1567.77	1567.77	17.00	1567.77
C65	17.00	1567.34	17.00	1567.34	1567.34	17.00	1567.34
C66	17.00	1566.91	17.00	1566.91	1566.91	17.00	1566.91
C67	17.00	1566.48	17.00	1566.48	1566.48	17.00	1566.48
C68	17.00	1566.05	17.00	1566.05	1566.05	17.00	1566.05
C69	17.00	1565.62	17.00	1565.62	1565.62	17.00	1565.62
C70	17.00	1565.19	17.00	1565.19	1565.19	17.00	1565.19
C71	17.00	1564.76	17.00	1564.76	1564.76	17.00	1564.76
C72	17.00	1564.33	17.00	1564.33	1564.33	17.00	1564.33
C73	17.00	1563.90	17.00	1563.90	1563.90	17.00	1563.90
C74	17.00	1563.47	17.00	1563.47	1563.47	17.00	1563.47
C75	17.00	1563.04	17.00	1563.04	1563.04	17.00	1563.04
C76	17.00	1562.61	17.00	1562.61	1562.61	17.00	1562.61
C77	17.00	1562.18	17.00	1562.18	1562.18	17.00	1562.18
C78	17.00	1561.75	17.00	1561.75	1561.75	17.00	1561.75
C79	17.00	1561.32	17.00	1561.32	1561.32	17.00	1561.32
C80	17.00	1560.89	17.00	1560.89	1560.89	17.00	1560.89
C81	17.00	1560.46	17.00	1560.46	1560.46	17.00	1560.46
C82	17.00	1560.03	17.00	1560.03	1560.03	17.00	1560.03
C83	17.00	1559.60	17.00	1559.60	1559.60	17.00	1559.60
C84	17.00	1559.17	17.00	1559.17	1559.17	17.00	1559.17
C85	17.00	1558.74	17.00	1558.74	1558.74	17.00	1558.74
C86	17.00	1558.31	17.00	1558.31	1558.31	17.00	1558.31
C87	17.00	1557.88	17.00	1557.88	1557.88	17.00	1557.88
C88	17.00	1557.45	17.00	1557.45	1557.45	17.00	1557.45
C89	17.00	1557.02	17.00	1557.02	1557.02	17.00	1557.02
C90	17.00	1556.59	17.00	1556.59	1556.59	17.00	1556.59
C91	17.00	1556.16	17.00	1556.16	1556.16	17.00	1556.16
C92	17.00	1555.73	17.00	1555.73	1555.73	17.00	1555.73
C93	17.00	1555.30	17.00	1555.30	1555.30	17.00	1555.30
C94	17.00	1554.87	17.00	1554.87	1554.87	17.00	1554.87
C95	17.00	1554.44	17.00	1554.44	1554.44	17.00	1554.44
C96	17.00	1554.01	17.00	1554.01	1554.01	17.00	1554.01
C97	17.00	1553.58	17.00	1553.58	1553.58	17.00	1553.58
C98	17.00	1553.15	17.00	1553.15	1553.15	17.00	1553.15
C99	17.00	1552.72	17.00	1552.72	1552.72	17.00	1552.72
C100	17.00	1552.29	17.00	1552.2			

PRIVATE ROAD NETWORK DRAWINGS FOR PALOMINO MAJOR PLAT, PHASE 4

WESTERN PACIFIC ENGINEERING & SURVEY

Prepared By



VICINITY MAP

BENCH MARK LISTING

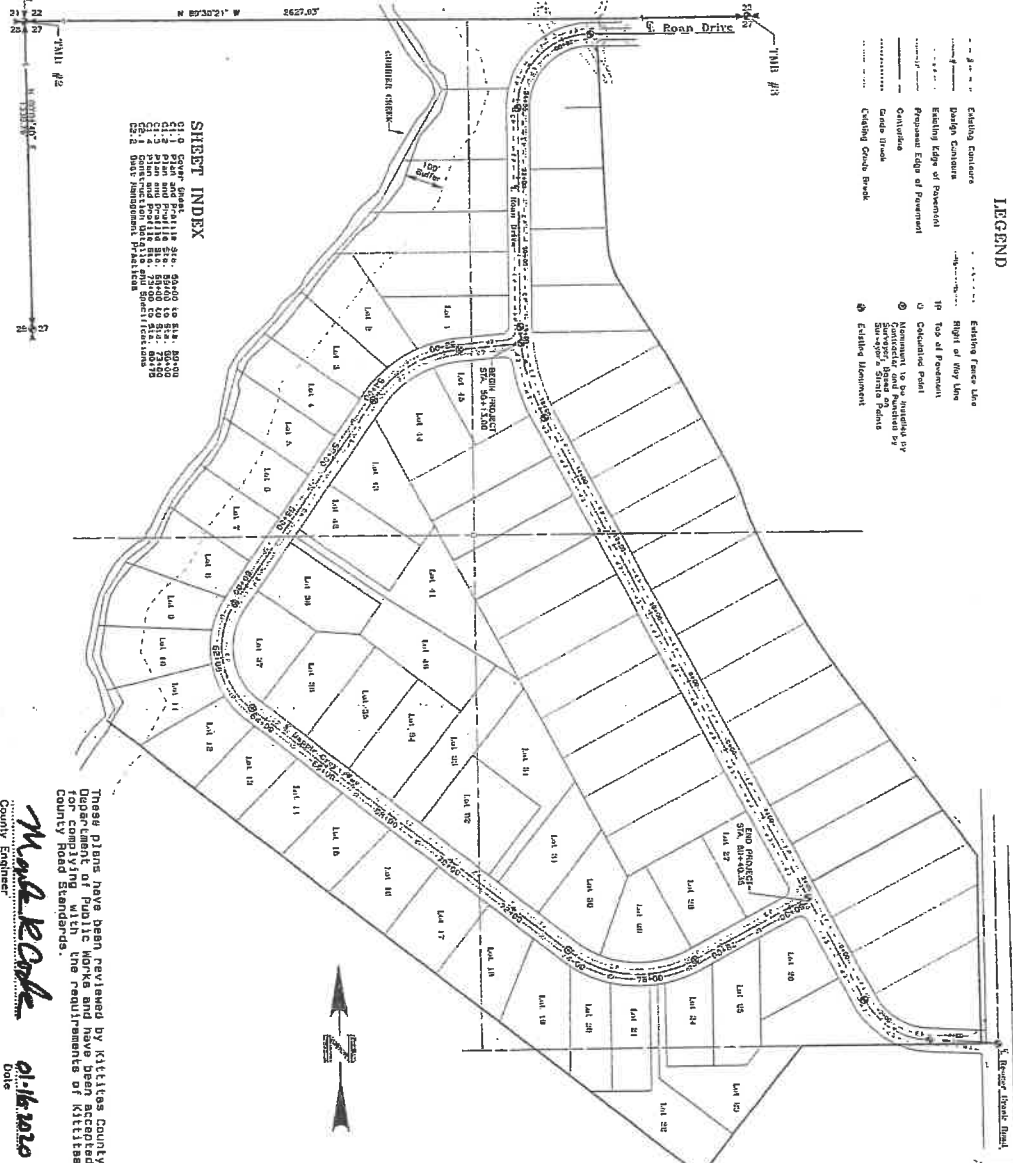
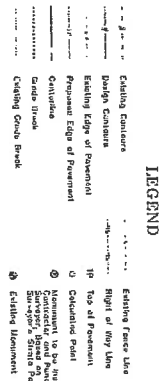
BM41 - Found monument marking the northeast corner of Section 22. Elevation: 1592.25
 BM42 - Found monument marking the southeast corner of Section 22. Elevation: 1592.25
 BM43 - Found monument marking the southeast corner of Section 22. Elevation: 1592.25
 BM44 - Found monument marking the southeast corner of Section 22. Elevation: 1592.25

NOTES:

The designer and his engineer shall be responsible for the design, construction, and maintenance of the road network shown on these drawings. The designer shall be responsible for the design, construction, and maintenance of the road network shown on these drawings. The designer shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.

ADDITIONAL NOTES:

1. Inspection of construction shall be made at intervals during the construction. If a defect is observed, the contractor shall be notified immediately and the defect corrected before the contractor proceeds with the work.
2. All materials used in the construction shall be of the best quality and shall be approved by the County Engineer.
3. All construction shall be in accordance with the specifications and standards of the County Engineer.
4. The contractor shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.
5. The contractor shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.
6. The contractor shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.
7. The contractor shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.
8. The contractor shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.
9. The contractor shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.
10. The contractor shall be responsible for the design, construction, and maintenance of the road network shown on these drawings.



SHEET INDEX

Sheet 1: Lots 1-10
 Sheet 2: Lots 11-20
 Sheet 3: Lots 21-30
 Sheet 4: Lots 31-40
 Sheet 5: Lots 41-50
 Sheet 6: Lots 51-52

These plans have been reviewed by the County Engineer and approved for filing with the County Clerk for recording. The County Engineer's name and title are shown below.

M. A. K. K.
 County Engineer

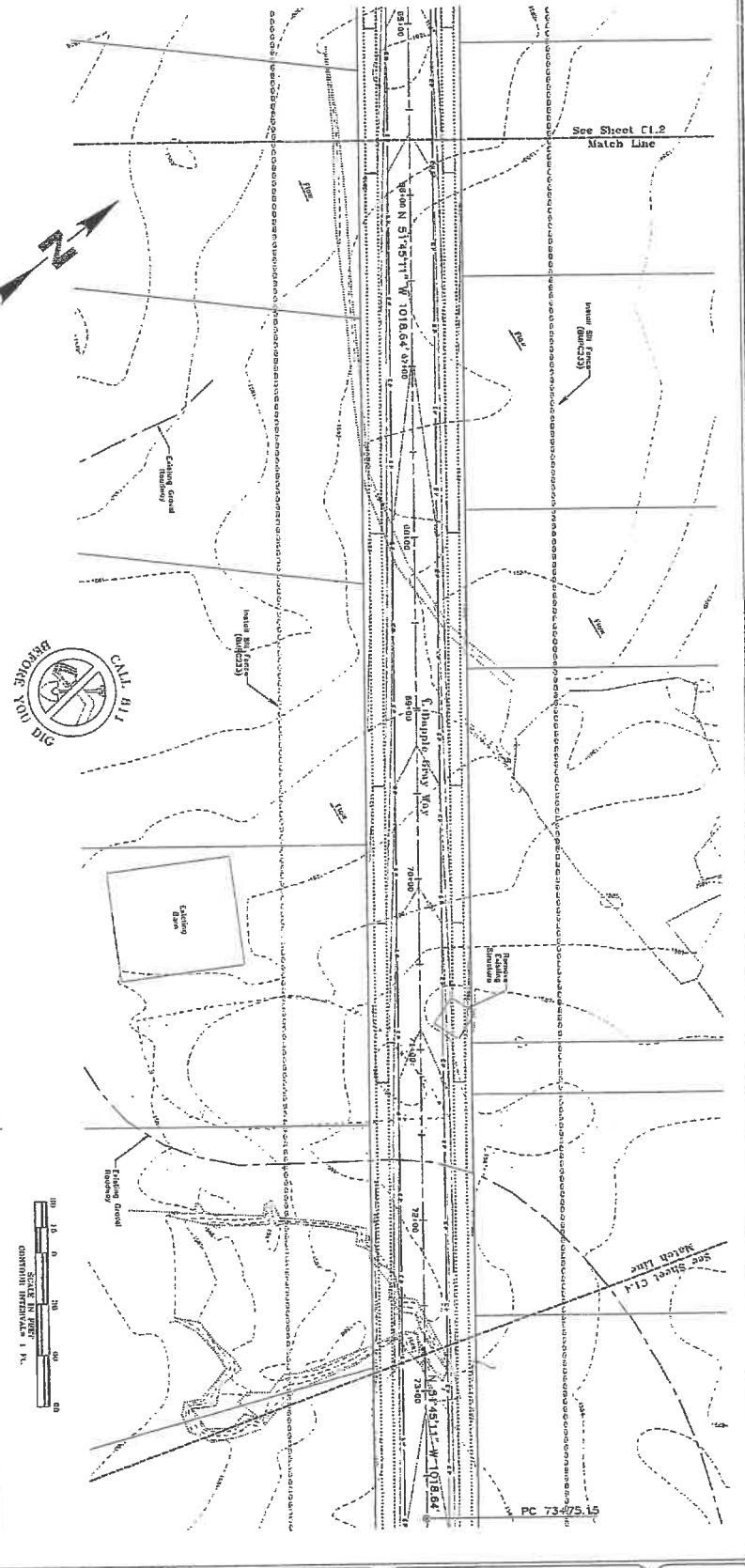
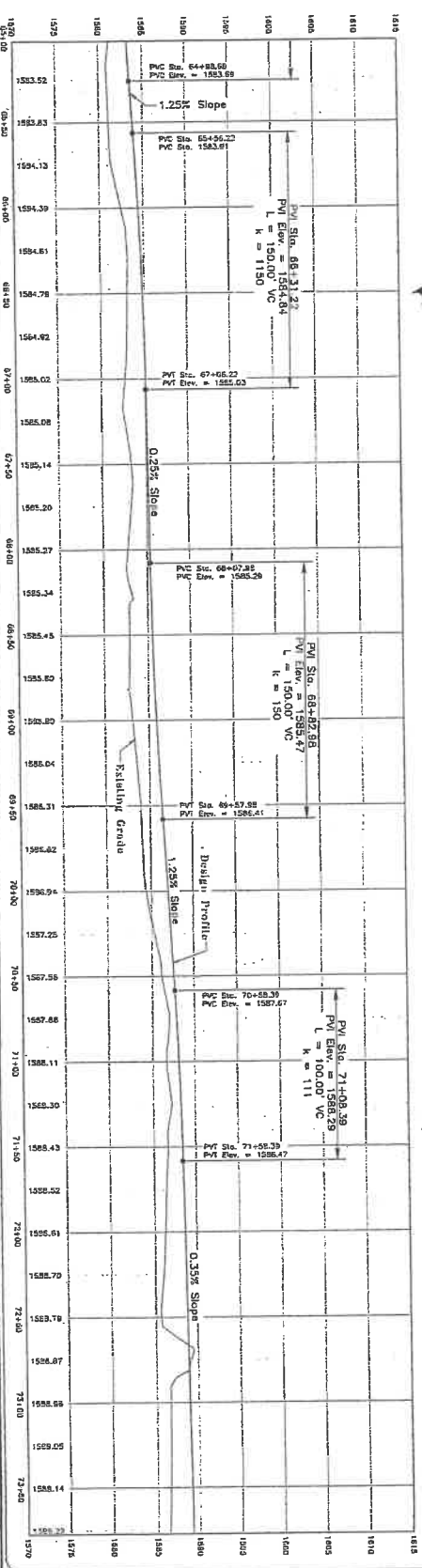
D. J. K.
 Date

SHEET NO. C1.0
 181827

LCU, INC.
PALOMINO MAJOR PLAT, PHASE 4
DAUBLE GRAY WAY IMPROVEMENTS
 Cover Sheet

WESTERN PACIFIC
ENGINEERING & SURVEY
 A TERRA DEVELOPMENT SERVICES CORPORATION
 1225 E. Hunter Street, Alhambra, California 91803
 Telephone: (626) 765-1023 Fax: (626) 765-1286





SHEET NO.
C1.3
 of 16 sheets
 181827

LCU, INC.
 PALOMINO MAJOR PLAT, PHASE 4
 DAPLE GRAY WAY IMPROVEMENTS
 Plan and Profile Sta. 66+00 to Sta. 73+00
 Skidway County Washington

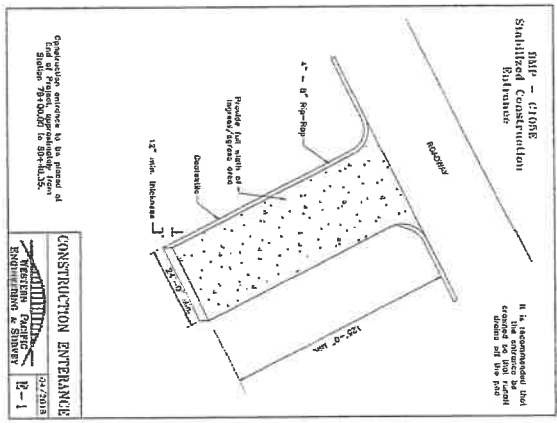
No.	Revised	Date	By

WESTERN PACIFIC ENGINEERING & SURVEY
 A TRUCK DEVELOPMENT SERVICES CORPORATION
 1328 E. Hunter Place, Moses Lake, Washington
 (509)766-1025 F(509)765-1298
 Service in Washington and Idaho



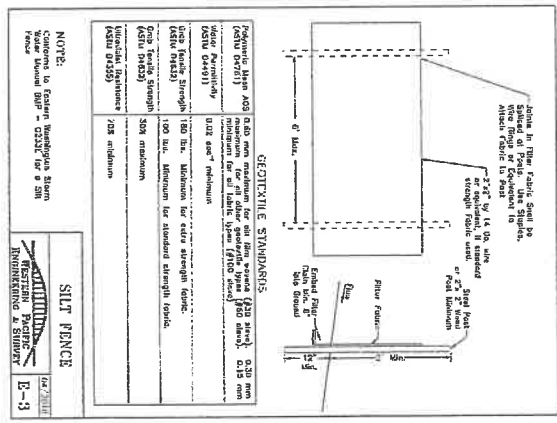
NOTES:

- 1. **WORK DISTRICT LIMITS**
 The project and proposed work area of this contract, as shown on the plan, shall be restricted to the boundaries of the project and proposed work area. No work shall be performed outside these boundaries. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies.
- 2. **ESTABLISHMENT OF BOUNDARIES**
 Construction areas or activities occurring on adjacent areas shall be delineated, as required, by the contractor. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies.



CONSTRUCTION ENTRANCE
 WESTERN PACIFIC
 ENGINEERING & SURVEY

- 3. **CONTROL PLAN AREA**
 The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies.
- 4. **STABILIZATION OF SOILS**
 The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies.



SILT FENCE
 WESTERN PACIFIC
 ENGINEERING & SURVEY

- 5. **POST-HOLE STABILIZATION**
 The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate agencies.

Prepared by: JMM
 Checked by: JMM
 Drawn by: JMM
 Printed by: JMM
 Date: 11/11/11
 Scale: 1" = 10'-0"

LCU, INC.
PALOMINO MAJOR PLAT, PHASE 4
DAPPLE GRAY DRIVE IMPROVEMENTS
Best Management Practices

No.	Revision	Date	By

WESTERN PACIFIC
ENGINEERING & SURVEY
 A TERRA DEVELOPMENT SERVICES CORPORATION
 1328 E. Hunter Place, Pease Lake, Washington
 98053-1100
 Telephone: (360) 735-1234
 Fax: (360) 735-1235
 Website: www.westernpac.com





ENGINEERS SPECIAL INSPECTORS PLANNERS SURVEYORS

WESTERN PACIFIC ENGINEERING & SURVEY

PIONEER WAY PROFESSIONAL CENTER

1328 E. HUNTER PLACE

MOSES LAKE, WASHINGTON 98837

OFFICE: (509) 765-1023

FAX: (509) 765-1298

August 1, 2019

LCU, Inc.
Attn: Pat Deneen
P.O. Box 394
Cle Elum, Washington 98922

SUBJECT: Stormwater Management Plan for Phase IV of the Palomino Major Plat located in Ellensburg, Washington.
WPES Project No. 18540

Dear Mr. Deneen:

The purpose of this letter is to outline the stormwater management plan for Phase IV of the Palomino Major Plat in Ellensburg, Washington. The scope of Phase IV of the Palomino Major Plat development, includes the construction of Dapple Gray Way to service 45 additional residential lots. It is expected that each of the lots will contain newly constructed single family homes. The development is located approximately three miles northwest of downtown Ellensburg, Washington. The site can be accessed to the northwest from Bowers Road or from the southeast from Reecer Creek Road. More particularly, the site is located in the Northwest quarter of Section 27, Township 18 North, Range 18 East, W.M., on Kittitas County's Tax Parcel No. 491033

The area in which the Palomino Fields Development is located, is known to have seasonal high ground water during the summer months. Due to the high groundwater, the traditional trenches and swales used to manage stormwater runoff are highly unlikely to function properly. Problems with the high ground water were encountered during the construction of Phase I of this development. At that time, we worked closely with Kittitas County to come up with a solution that would best manage the stormwater runoff from this development. As a result, the road design for this development calls for raising the road bed above the existing native grade. In raising grade of the road, the stormwater will be able to run off the roadway. In order to handle the runoff from the roadway, as well as the lots themselves, the area located along the roadbed will be reserved to be used as infiltration areas. By minimizing compaction and allowing only drought resistant low growing grasses to be planted in these infiltration areas, the stormwater runoff will be able to properly infiltrate into the ground.

Attached to this letter is an exhibit showing a typical cross section of the stormwater infiltration areas located along the roadway. Within the infiltration area, one foot tall rock check dams will be installed at every foot of vertical grade drop. These check dams are intended to decrease the stormwater flow, minimize channel scour, and promote deposit of sediment. BMP C207, of the *Eastern Washington Stormwater Management Manual*, published by the Washington State Department of Ecology, shall

be followed during the construction of the check dams. As you know, you will also be required to follow all Washington Department of Ecology and Kititas County Stormwater Standards during the construction of this development.

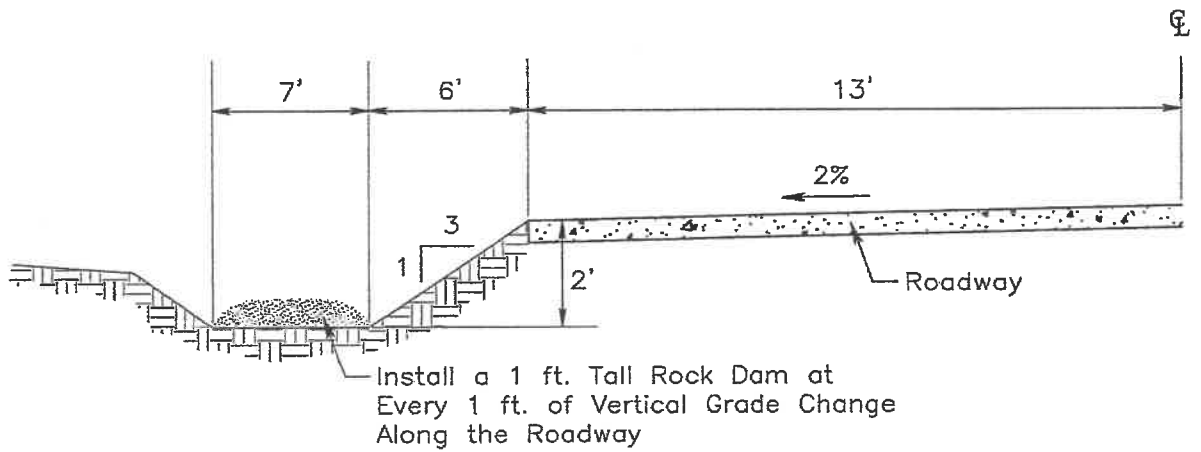
Thank you for allowing us to serve your engineering needs. If you have any further questions, please feel free to contact our office.

Sincerely,



Nathaniel D. Nofziger, P.E.
WESTERN PACIFIC ENGINEERING & SURVEY
1328 E. Hunter Place
Moses Lake, Washington 98837
(509) 765-1023





NOTES:

1. The Roadway shall be built up from the native grade. Stormwater collection areas shall not be dug out, or below native grade.
2. Drought resistant, low growing grasses shall be planted in the stormwater collection areas.

WESTERN PACIFIC
ENGINEERING & SURVEY
 A TERRA DEVELOPMENT SERVICES CORPORATION

1328 East Hunter Place
 Moses Lake, WA
 T:(509)765-1023
 F:(509)765-1298

PALOMINO MAJOR PLAT
 Stormwater Exhibit
 Ellensburg, Washington

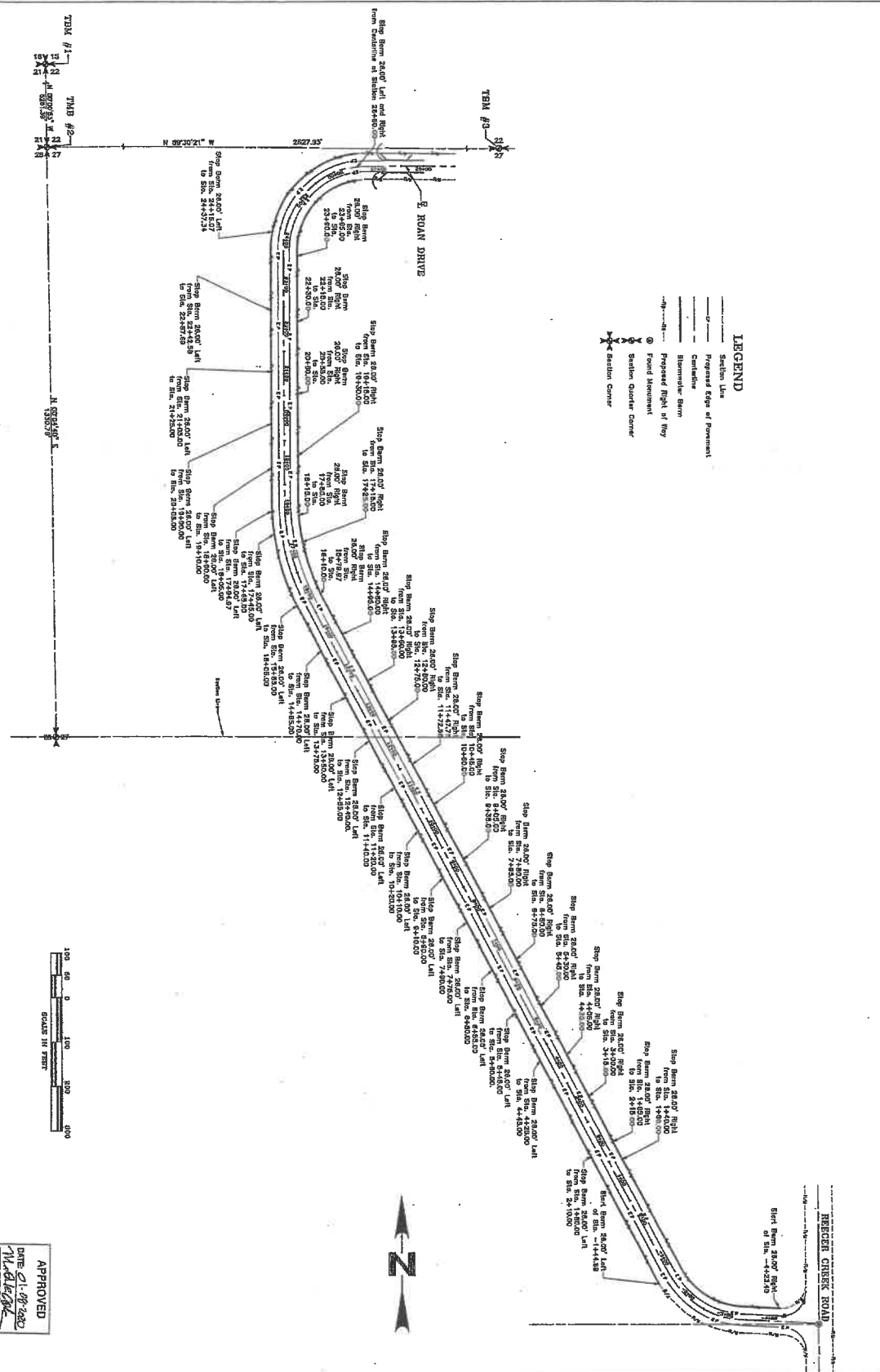
DRAWN BY: BNO
 CHECKED BY: NDN

DATE:
 07/2019

WPE PROJECT #:
 18541

Scale: 1" = N/A
 PLATE NO.: 01

COUNTY ROAD NETWORK AMENDMENT FOR PALOMINO MAJOR PLAT



LEGEND

- Section Line
- Proposed Edge of Pavement
- Centerline
- Blotterless Beam
- Proposed Right of Way
- Point Measurement
- Station Quarter Center
- Station Center



APPROVED
DATE 11-08-2017
WESTERN PACIFIC ENGINEERING & SURVEY

SHEET NO. C1.1 181887	Designed by: [Signature] Checked by: [Signature] Project No. 181818 Date: 11/08/2017 Scale: 1" = 40' See Pgs. 1 to 10 of 10	LCU, INC. PALOMINO MAJOR PLAT, PHASE 2 & 3 ROAN DRIVE STORMWATER ALTERATIONS Road Layout		WESTERN PACIFIC ENGINEERING & SURVEY A TERRA DEVELOPMENT SERVICES CORPORATION 1320 E. Waller Plaza, Meridian Falls, Washington 75209-7543 (936) 452-0200 P(936)752-1295 Services to Washington and Idaho		KINGMAN COUNTY KINGMAN COUNTY ENGINEER
		No.	Revisions	Date	By	Washington

STORMWATER REPORT

PALOMINO MAJOR PLAT, PHASE II & III

LCU Inc.

Prepared by

WESTERN PACIFIC ENGINEERING and SURVEY

1328 E. Hunter Place
Moses Lake, Washington 98837
(509) 765-1023

WPES Project Number 18413
October 2019



October 18, 2019

LCU, Inc.
Attn: Pat Deneen
P.O. Box 394
Cle Elum, Washington 98922

SUBJECT: Revised Stormwater Report for Phase II and III of the Palomino Major Plat located in Ellensburg, WA
WPES Project No. 18413

Dear Mr. Deneen:

Please find the attached revised Stormwater Report for Phase II and III of the Palomino Major Plat in Ellensburg, Washington. This revised report incorporates the feedback and current construction conditions as they exist on-site today. As you know, you will be required to follow all Washington Department of Ecology and Kittitas County Stormwater Standards during construction.

Thank you for allowing us to serve your engineering needs. If you have any questions concerning the attached report, please feel free to contact our office.

Sincerely,



Nathaniel D. Nofziger, P.E.
WESTERN PACIFIC ENGINEERING & SURVEY
1328 E. Hunter Place
Moses Lake, Washington 98837
(509) 765-1023



Proposed Development and Existing Site Conditions

The original scope of this project included the development of approximately thirty-five hundred feet of private roadway network to serve thirty-six new single-family residences. Broken out into three phases, each phase would deal with a specific area of the development. This revised report specifically relates to the second and third phases of the overall project. This revision is required due to the reclassification of the roadway from a private road network to a public network and the presence of additional underground utilities.

Current project scope for phases two and three includes the extension of Roan Drive from its current location until it terminates at Reecer Creek Road. The development is located approximately three miles northwest of downtown Ellensburg, Washington. The site can be accessed to the northwest from Bowers Road or from the southeast by Reecer Creek Road. More specifically, the site is located in the Northwest quarter of Section 27, Township 18 North, Range 18 East, W.M., on Kittitas County's Tax Parcel No. 491033

During the preliminary phases of this project, it was determined that the site experienced extremely high-water levels during the summer months. As such, the installation of traditional ditches and swales would be unfeasible. Without the ability to excavate for stormwater collection and infiltration, an elevated roadbed is the most reasonable solution to allow for grading and stormwater management.

In raising the grade of the road, stormwater will be able to run off the roadway and collect in constructed ditches. To accommodate the runoff from the roadway, areas outside the asphalt and compacted gravel shoulder will be left uncompacted to allow maximum infiltration capability. By minimizing compacted areas and allowing plant growth in these infiltration areas, the stormwater runoff will be able to properly infiltrate into the ground.

In the original design, the roadway was intended to be a private road. With this classification, the runoff from the roadway, driveways, and structures placed on each lot would need to have a stormwater collection system. Changing to a county road allows for only the stormwater running off from the roadway itself to be collected and stored. Each property will maintain their runoff on-site.

On October 17th, 2014, Budinger & Associates performed two shallow depth bores to determine soil classification and layer thickness. These bores were located to the west of the existing Bowers Road, approximately 100' and 400' respectively. These locations serve as the primary location for the Phase I development. Results from these tests are included in the appendix. This data indicates that primarily sands and gravels are present on site with a standing water table of five and a half feet or less at the time of boring.

On June 5th, 2018, Western Pacific Engineering and Survey was on site to dig test pits and collect soil samples representative of the native material found on site. The test pits were located in the vicinity of the bridge abutments. The soil conditions, drainage characteristics, and pertinent soil design information was gathered and analyzed for use within this report. The soil analysis, as well as a map showing locations of the test pits, can be found in the appendix.



The proposed development is classified as a low-use site as defined by the 2019 Stormwater Management Manual for Eastern Washington (SWMMEW). Roan Drive is a county road with an average daily traffic (ADT) count of less than 7,500 vehicles, categorizing it as a low-use site according to Table 5.22: Pollutant Loading Classifications for Solids, Metals, and Oil in Stormwater Runoff Directed to UIC Wells.

The natural topography is generally uniform in grade, sloping downward to the southwest. The surface of property is covered in a variety of native grasses. Within the boundaries of Phase III of this project, there is an abandoned irrigation ditch that runs east to west. This irrigation ditch is no longer in use and portions of it will be filled in as necessary. Other important features to note are Currier Creek, the Town Ditch, and their proximity to the site. The Town Ditch borders the eastern portion of the site and Currier Creek is located to the west.

Basin Analysis

After placement of new roadway, the original drainage flow will be disrupted due to the elevated roadbed design. All stormwater that lands within the established Right of Way (ROW) will be collected and stored until it is able to infiltrate. The native soils are somewhat permeable, but will have limited infiltration prior to the soils becoming saturated due to the high-water table. For areas outside the ROW, runoff will be similar to pre-construction conditions.

For this development it is important that the stormwater runoff from the roadway does not directly flow into Currier Creek, due to the potential for contaminants. To protect Currier Creek, construction means and methods shall be consistent with the Stormwater Management Manual for Eastern Washington. For the purpose of this stormwater management document, only the stormwater that lands within the Right of Way will be considered.

General Calculation Procedure

When computing the required infiltration and storage areas for the site, a number of design assumptions were made. These assumptions include: each lot would have its own driveway, approximately twenty feet wide, Roan Drive will be approximately twenty-six feet wide for the 3,250 feet long roadway, approximately twenty linear feet would be subtracted from effective ditch length for each utility cluster, and the infiltration rate is assumed to be zero feet per second to account for the high groundwater table and inability for native soils to infiltrate stormwater.

By quantifying the type of ground cover present on site, a more accurate representation of infiltration and storage is possible. The impervious area, consisting of the roadway and individual driveways, covers approximately 2.2 acres. The pervious cover, consisting of the ditches and shoulders along the roadway, adds an additional 1.3 acres. In accordance with the Kittitas County Code, the rainfall intensity and time of concentration from a 25-year storm were used. A rainfall volume of 1.6 inches, along with Type 1A hydrograph were used to analyze the volume of stormwater expected from the site.



According to the United States Department of Agriculture's (USDA) Soil Survey, the soils in the area have a Hydraulic Soil Group rating of C/D or better. Runoff Curve Number (CN) values can be pulled directly from Table 4.5.2, found in the Stormwater Management Manual for Eastern Washington, published by the Washington State Department of Ecology. For the impervious paved areas, the CN value is 98. For the previous areas, the CN value of 87 for open spaces with less than 50% grassy cover was used. This CN value was chosen as the infiltration areas are designed to be seeded with low-irrigation plants and may not assist in the infiltration of stormwater.

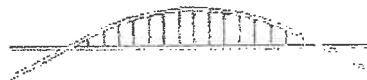
Based on the Budinger & Associates soil exploration data, project soils are classified as poorly graded clean gravels or gravel-sand mix (GP) according to Unified Soils Classification System with a hydraulic permeability of 0.01 feet per minute.

Based on our own research and soil sampling, the soils most closely resemble silty sands or poorly graded sand-silt mix (SM) with a hydraulic permeability of 5×10^{-5} feet per minute within the first foot of depth. For the remainder of the tests, for depths greater than a foot, the soils present have a higher hydraulic conductivity than the initial layer. As such, the lowest value will be used for calculations as it is the limited factor in stormwater infiltration. The data gathered by Western Pacific Engineering & Survey has been included in the appendix.

Lastly, by utilizing the United States Department of Agriculture's Web Soil Survey tool, a soil map encompassing the project site and the present soils with their respective engineering and physical properties was obtained. Using the median value for the topsoil infiltration rate returned a value of 0.0018 feet per second. Data sheets utilized to determine the soil type and infiltration rates are included in the appendix. To provide a factor of safety, an assumed infiltration rate of zero feet per second is used to determine the required 100-year storm storage capacity. As such, the required storage for a zero-infiltration scenario is the design standard.

Current earthwork design calls for a one-and-a-half-foot tall berm on the outside of the ditch and a two-foot berm on the inside of the ditch with a trough between them. This depression will contain the stormwater from the roadway. With a design infiltration value of zero feet per second, the required storage is 13,737 ft³. This amount of water equates to approximately 7.5" and 6.5" of standing water in the left and right ditches, respectively. While the right ditch accepts more runoff, it also has a longer effective length due to the super-elevated roadway, thereby giving it a lower standing depth. With 100-year storm during frozen ground conditions, the stormwater collection system is capable of impounding all runoff without the need for any infiltration. During typical, non-frozen conditions, a storage depth of 2" or less should be expected based on median infiltration rates.

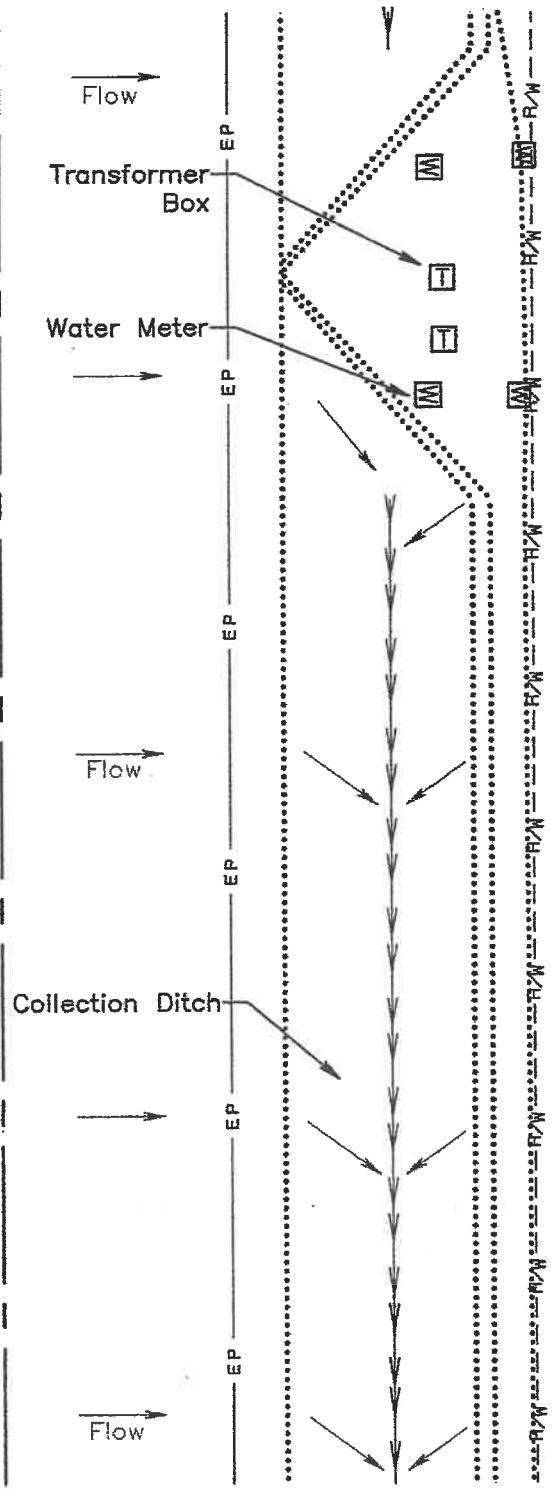
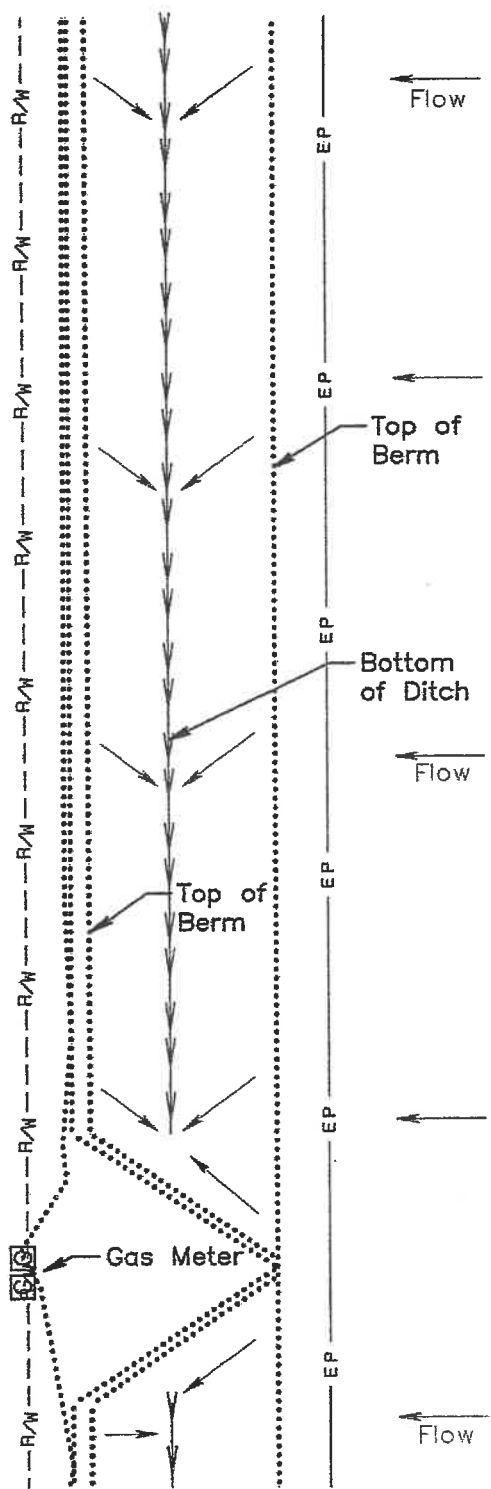
Taking all of the above information into consideration, it was determined that for an SCS Type 1A regional storm, the designed stormwater collection system is more than capable of handling the runoff from Roan Drive.



Appendices and Attachments

- Typical Layout Runoff Map
- Typical Roadway Cross-Section
- Budinger & Associates Soil Bore Data
- WPES Soil Classification
- USDA Soil Classification
- 25-Year Storm Map
- Stormwater Manual Hydrology Tables
- Infiltration Area Calculations
- Basin Runoff Calculations





1328 East
 Hunter Place
 Moses Lake, WA
 T:(509)765-1023
 F:(509)765-1298

LCU, INC.
Palomino Flats Runoff Map
Typical Layout

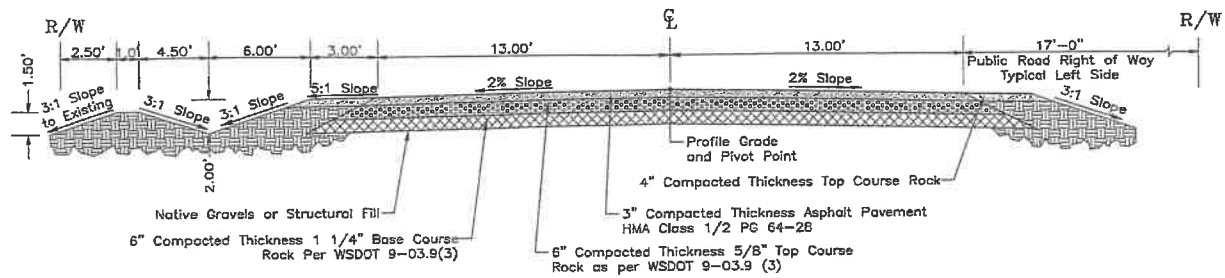
DRAWN BY: TSL
 CHECKED BY: NDN

DATE:
 October 9, 2019

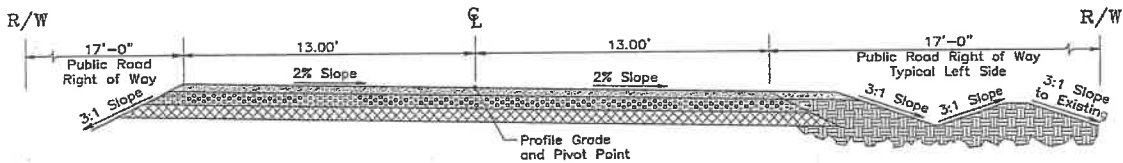
WPE PROJECT #:
 18413

Scale: 1" = 10'
 PLATE NO.: 01

TYPICAL ROADWAY SECTION



SUPER ROADWAY SECTION Sta. -4+23.40 to Sta. -1+44.69



**WESTERN PACIFIC
ENGINEERING & SURVEYING**
 A TRISTATE PROFESSIONAL SERVICE CORPORATION
 1400 Buellier Place
 Menlo Park, CA 94025
 (415) 708-1023

No.	Revision	Date	By

LCU, INC.
PALOMINO FLATS DRAINAGE
 Typical Cross-Section
 Washington
 Kullias County

Designed by NDN
 Drawn by TML/TSL
 Checked by NDN
 Project No. 15443
 Date: October, 2018
 Scale:
 Hor. 1" = 40'
 Vert. 1" = 4'
 See 27, 7, 18, 8, 18 E

SHEET NO.
1 of 1

P:\15443\15443.dwg 10/18/18 10:10:10 AM

TEST PIT 1

Date of Boring: 10-17-14
Driller: client
Type of Drill: Bobcat E42 Mini-excavator
Location: ~ 50 feet west of Reecer Creek Road at Bowers Road
Surface: sparse grass and weeds

Elevation: 100 ft
Logged by: T. Black
Size of hole: 5 ft by 10 ft

DEPTH	SAMPLES REQD, BLOW COUNTS N (% RECOVERY) <i>(blows/ft)</i>	MOISTURE, COLOR, CONDITION	DESCRIPTION	SOIL LOG	TEST RESULTS									
					ATTERBERG LIMITS PL ----- LL WATER CONTENT ○ STANDARD PEN TEST, N-VALUE (OBSERVED) ■ 3" SPLIT SPOON PENETRATION, BLOWS/FT ■									
0					10	20	30	40	50	60	70	80	90	
		moist, dark brown to brown, loose	SAND with Silt and Organics (roots)											
		moist, brown to reddish brown, loose to medium dense	GRAVEL with Sand and Cobbles, occasional Boulders, coarse, rounded											
5			(free groundwater at 5 feet)											
		saturated, gray, loose to medium dense	GRAVEL with Sand, occasional Cobbles and Boulders, coarse, rounded											
			End of Boring @ 5.5 ft											
10														

TEST PIT LWWWT S14484 TEST PIT LOGS.GPJ BUDINGER.GDT 10/23/14



Budinger & Associates
 3820 E. Broadway Ave.
 Spokane, WA 99202

TEST PIT LOGS FIGURE 3-1

Project: Palomino Road Extension
 Location: Ellensburg, WA
 Number: S14484

TEST PIT 2

Date of Boring: 10-17-14

Driller: client

Type of Drill: Bobcat E42 Mini-excavator

Location: ~ 400 feet west of Reecer Creek Road at Bowers Road

Surface: sparse grass and weeds

Elevation: 95 ft

Logged by: T. Black

Size of hole: 5 ft by 10 ft

DEPTH	SAMPLES REQD, BLOW COUNT'S N (% RECOVERY) <i>(blows/6" (ftalics))</i>	MOISTURE, COLOR, CONDITION	DESCRIPTION	SOIL LOG	TEST RESULTS									
					ATTERBERG LIMITS PL ----- LL WATER CONTENT ○ STANDARD PEN TEST, N-VALUE (OBSERVED) ■ 3" SPLIT SPOON PENETRATION, BLOWS/FT ■									
0					10	20	30	40	50	60	70	80	90	
		moist, dark brown to brown, loose	SAND with Silt and Organics (roots)											
		moist, brown to reddish brown, loose to medium dense	GRAVEL with Sand and Cobbles, occasional Boulders, coarse, rounded											
			▽ (free groundwater at 4 feet)											
5		saturated, gray, loose to medium dense	GRAVEL with Sand, occasional Cobbles and Boulders, coarse, rounded											
			End of Boring @ 5 ft											
10														

TEST PIT L\WWWIT S14484 TEST PIT LOGS, GPJ BUDINGER, GDT 10/23/14



Budinger & Associates
 3820 E. Broadway Ave.
 Spokane, WA 99202

TEST PIT LOGS FIGURE 3-2

Project: Palomino Road Extension

Location: Ellensburg, WA

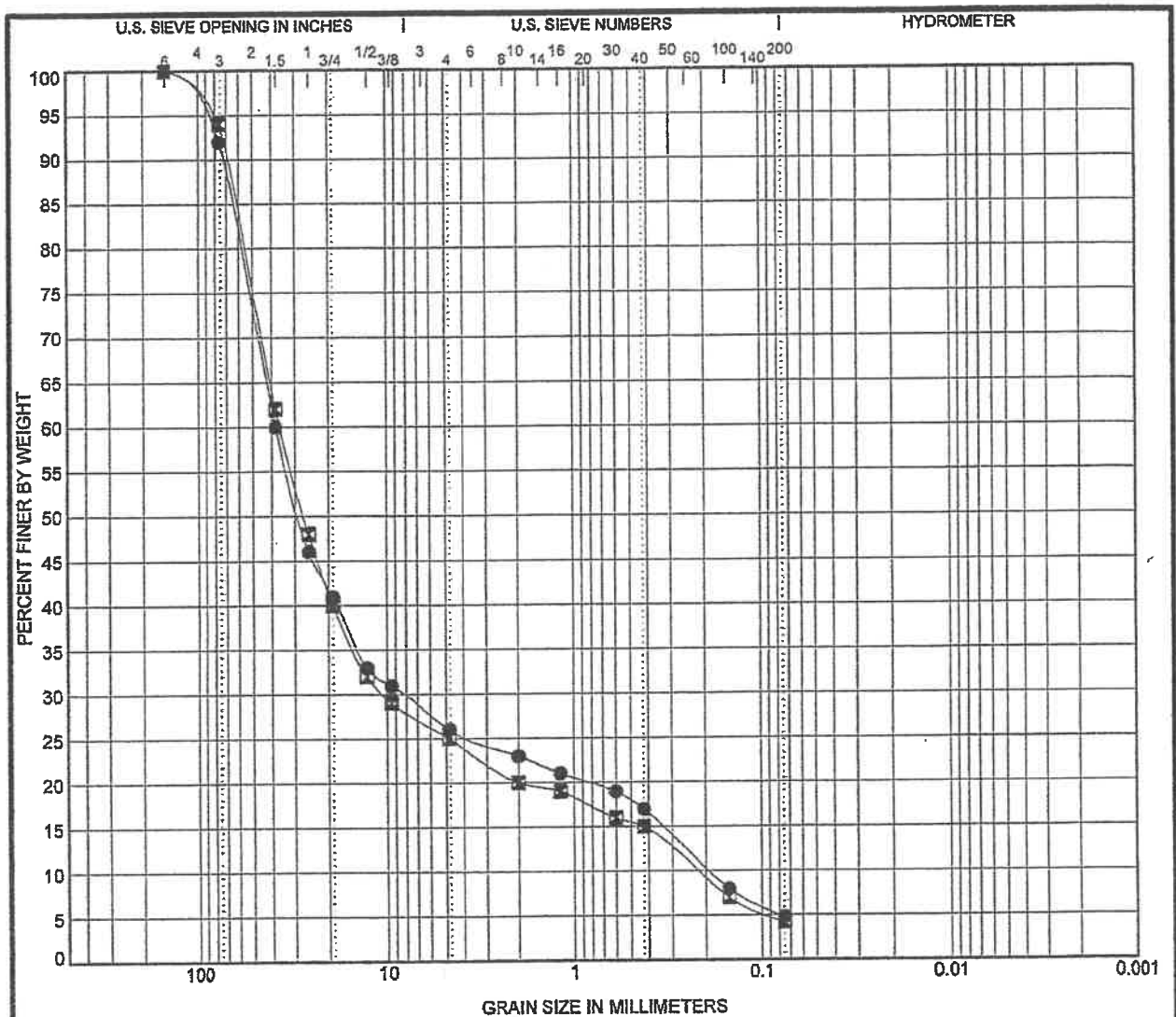
Number: S14484

**SOIL MECHANICS
LABORATORY SUMMARY**

LABORATORY NUMBER		Units	Test Methods	TEST 1	TEST 2
TEST PIT NUMBER				1	2
DEPTH	TOP	feet		1.0	1
	BOTTOM	feet		3.0	3
SAMPLE TYPE				Bulk	Bulk
MOISTURE		%	ASTM D2216	6.5	6.0
LIQUID LIMIT		%		27	28
PLASTIC LIMIT		%	ASTM D 4318	24	18
PLASTICITY INDEX		%		3	10
UNIFIED CLASSIFICATION			ASTM D 2487	GP	GP
	6"		ASTM D 422	100	100
	3"			92	94
S	1½"	%		60	62
I	1"			46	48
E	¾" GRAVEL	P		41	40
V	½"	A		33	32
E	⅜"	S		31	29
	#4	S		26	25
S	#10	I		23	20
I	#16	N		21	19
Z	#30 SAND	G		19	16
E	#40			17	15
	#100			8	7
	#200			4.8	4.2

*Budinger & Associates, Inc.
Geotechnical & Environmental Engineers
Construction Materials Testing & Special Inspection*

FIGURE 5



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● 1	1.0				9.56	200.99
■ 2	1.0				13.77	161.84

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 1	152.4	38	8.288	0.189	65.3	21.2	4.8	
■ 2	152.4	35.875	10.465	0.222	68.3	20.7	4.2	

U.S. GRAIN SIZE S14484 TEST PIT LOGS.GPJ BUDINGER.GDT 10/23/14



GRAIN SIZE DISTRIBUTION RESULTS
 Project: Palomino Road Extension
 Location: Ellensburg, WA
 Number: S14484

FIGURE 6



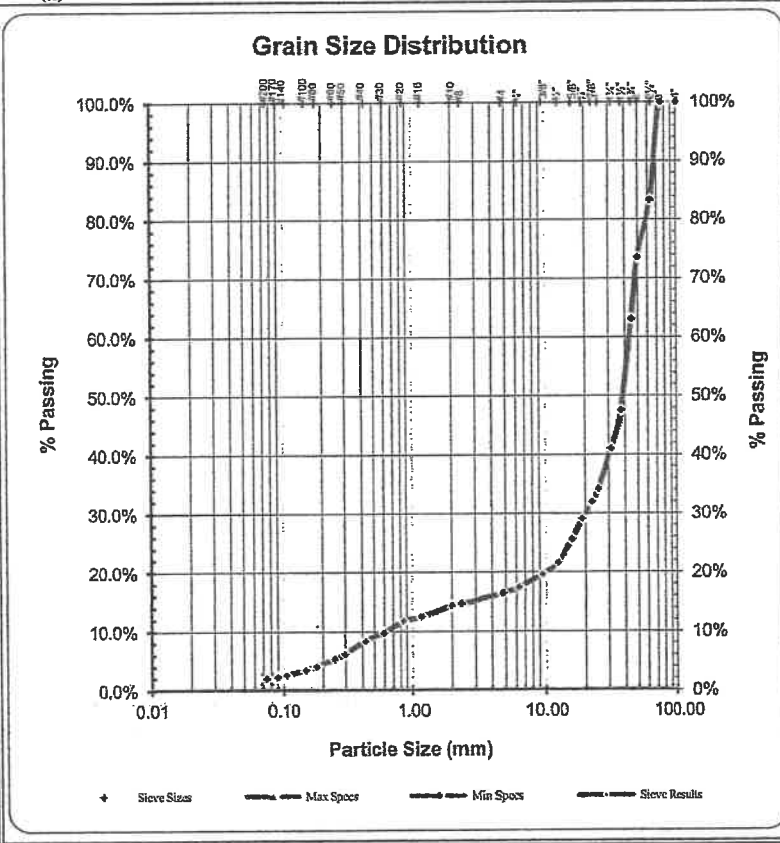
WESTERN PACIFIC ENGINEERING & SURVEY
 1328 E. Hunter Place, Moses Lake, Washington
 T: (509)765-1023 F: (509)765-1298



SIEVE ANALYSIS REPORT

Report To: LCU, Inc. Attn: Pat Deneen P.O. Box 394 Cle Elum, WA 98922	Date Sampled: 06/05/18 Date Received: 06/05/18 Date Tested: 06/07/18 Sampled By: WPE Sample Method: Test Pit	Project #: 18413 Sample #: 74 Source: On Site Description: T.P. #1 @ 6 ft
Specifications: No Specs Sample Meets Specs? n/a	ASTM D-2487 Unified Soils Classification System GP, Poorly graded Gravel	
Procedure: ASTM C136	D₁₀ = 0.623 mm % Gravel = 83.5% D₆₀ = 20.135 mm % Sand = 14.4% D₉₀ = 43.489 mm % Silt & Clay = 2.1%	Coeff. of Curvature, C _c = 14.97 Coeff. of Uniformity, C _u = 69.81 Fineness Modulus = 7.41

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
6.00"	150.00		100%		
4.00"	100.00		100%		
3.00"	75.00		100%		
2.50"	63.00	83%	83%		
2.00"	50.00	74%	74%		
1.75"	45.00		63%		
1.50"	37.50	48%	48%		
1.25"	31.50	41%	41%		
1.00"	25.00	34%	34%		
7/8"	22.40		32%		
3/4"	19.00	29%	29%		
5/8"	16.00		26%		
1/2"	12.50	22%	22%		
3/8"	9.50	20%	20%		
1/4"	6.30	17%	17%		
#4	4.75	16%	16%		
#8	2.360		15%		
#10	2.000	14%	14%		
#16	1.180		12%		
#20	0.850	12%	12%		
#30	0.600		10%		
#40	0.425	8%	8%		
#50	0.300		6%		
#60	0.250		5%		
#80	0.180	4%	4%		
#100	0.150		4%		
#140	0.106		3%		
#170	0.090		2%		
#200	0.075	2.1%	2.1%		



Technician: Jack Demont
 Engineer: Nathan Nofziger, P.E.

These test results relate only to the items tested, and were obtained in-lab unless otherwise specified.
 This report shall not be reproduced, except in full, without the prior written approval of WPES.



WESTERN PACIFIC ENGINEERING & SURVEY
 1328 E. Hunter Place, Moses Lake, Washington
 T: (509)765-1023 F: (509)765-1298



SIEVE ANALYSIS REPORT

Report To: LCU, Inc
 Attn: Pat Deneen
 P.O. Box 394
 Cle Elum, WA 98922

Date Sampled: 06/05/18
 Date Received: 06/05/18
 Date Tested: 06/08/18
 Sampled By: WPE
 Sample Method: Test Pit

Project #: 18413
 Sample #: 75
 Source: On Site
 Description: T.P. #1 @ 4 ft

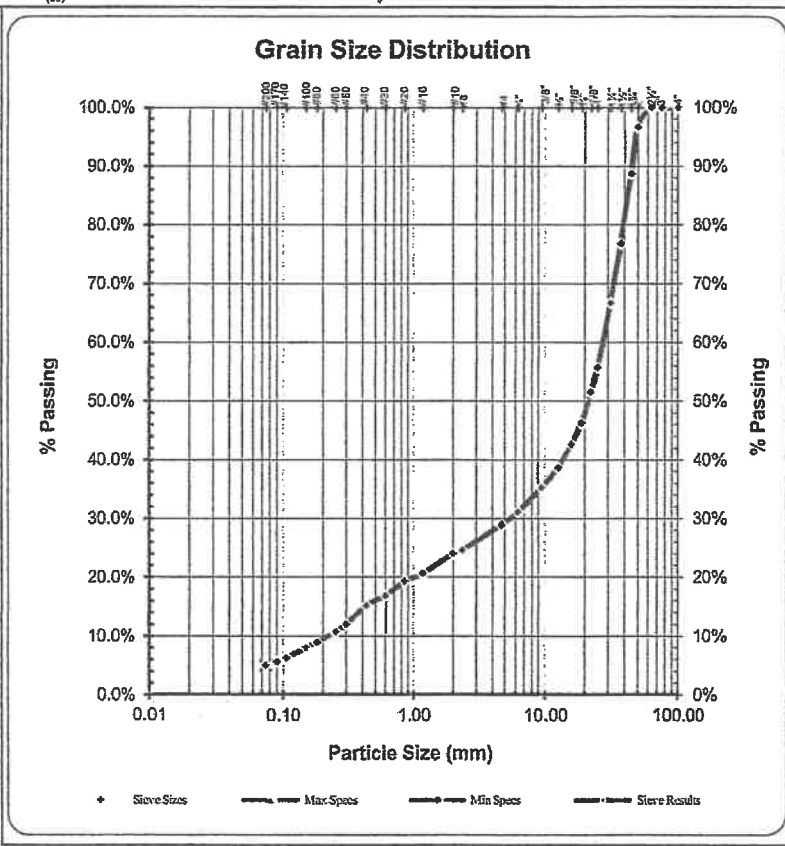
Specifications: No Specs
 Sample Meets Specs? n/a

ASTM D-2487 Unified Soils Classification System:
 GP-GM, Poorly graded Gravel with Silt and Sand

Procedure: ASTM C136

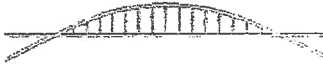
D_{10} = 0.223 mm % Gravel = 71.1% Coeff. of Curvature, C_c = 4.93
 D_{30} = 5.501 mm % Sand = 23.9% Coeff. of Uniformity, C_u = 123.76
 D_{60} = 27.549 mm % Silt & Clay = 5.1% Fineness Modulus = 6.31

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
6.00"	150.00		100%		
4.00"	100.00		100%		
3.00"	75.00		100%		
2.50"	63.00	100%	100%		
2.00"	50.00	97%	97%		
1.75"	45.00		89%		
1.50"	37.50	77%	77%		
1.25"	31.50	67%	67%		
1.00"	25.00	56%	56%		
7/8"	22.40		52%		
3/4"	19.00	46%	46%		
5/8"	16.00		43%		
1/2"	12.50	39%	39%		
3/8"	9.50	35%	35%		
1/4"	6.30	31%	31%		
#4	4.75	29%	29%		
#8	2.360		25%		
#10	2.000	24%	24%		
#16	1.180		21%		
#20	0.850	19%	19%		
#30	0.600		17%		
#40	0.425	15%	15%		
#50	0.300		12%		
#60	0.250		11%		
#80	0.180	9%	9%		
#100	0.150	8%	8%		
#140	0.106		6%		
#170	0.090		6%		
#200	0.075	5.1%	5.1%		



Technician: Jack Demont
 Engineer: Nathan Nofziger, P.E.

These test results relate only to the items tested, and were obtained in-lab unless otherwise specified.
 This report shall not be reproduced, except in full, without the prior written approval of WPES.



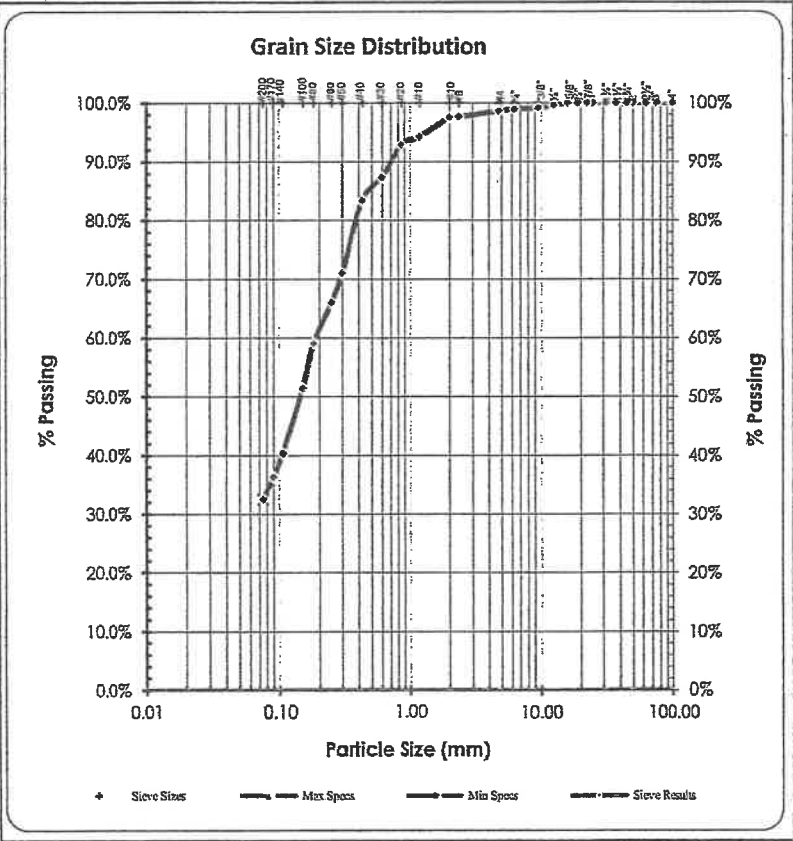
WESTERN PACIFIC ENGINEERING & SURVEY
 1328 E. Hunter Place, Moses Lake, Washington
 T: (509)765-1023 F: (509)765-1298



SIEVE ANALYSIS REPORT

Report To: LCU, Inc. Attn: Pat Deneen P.O. Box 394 Cle Elum, Washington 98922	Date Sampled: 06/05/18 Date Received: 06/05/18 Date Tested: 06/08/18 Sampled By: WPE Sample Method: Manual Native	Project #: 18413 Sample #: 76 Source: On-Site Description: T.P.# 1 @ 12"
Specifications: No Specs Sample Meets Specs ? n/a	ASTM D-2487 Unified Soils Classification System SM, Silty Sand	
Procedure: ASTM C117 Method B	$D_{(10)} = 0.023$ mm % Gravel = 1.4% $D_{(30)} = 0.069$ mm % Sand = 66.1% $D_{(60)} = 0.189$ mm % Silt & Clay = 32.5%	Coeff. of Curvature, $C_c = 1.10$ Coeff. of Uniformity, $C_u = 8.20$ Fineness Modulus = 1.01

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
6.00"	150.00		100%		
4.00"	100.00		100%		
3.00"	75.00		100%		
2.50"	63.00		100%		
2.00"	50.00		100%		
1.75"	45.00		100%		
1.50"	37.50		100%		
1.25"	31.50		100%		
1.00"	25.00		100%		
7/8"	22.40		100%		
3/4"	19.00		100%		
5/8"	16.00	100%	100%		
1/2"	12.50	100%	100%		
3/8"	9.50	99%	99%		
1/4"	6.30	99%	99%		
#4	4.75	99%	99%		
#8	2.360		98%		
#10	2.000	98%	98%		
#16	1.180		94%		
#20	0.850	93%	93%		
#30	0.600		87%		
#40	0.425	83%	83%		
#50	0.300		71%		
#60	0.250		66%		
#80	0.180	59%	59%		
#100	0.150		52%		
#140	0.106		40%		
#170	0.090		36%		
#200	0.075	32.5%	32.5%		



Technician: Jack Demont
 Engineer: Nathan Nofziger, P.E.

These test results relate only to the items tested, and were obtained in-lab unless otherwise specified.
 This report shall not be reproduced, except in full, without the prior written approval of WPES.



WESTERN PACIFIC ENGINEERING & SURVEY
 1328 E. Hunter Place, Moses Lake, Washington
 T: (509)765-1023 F: (509)765-1298



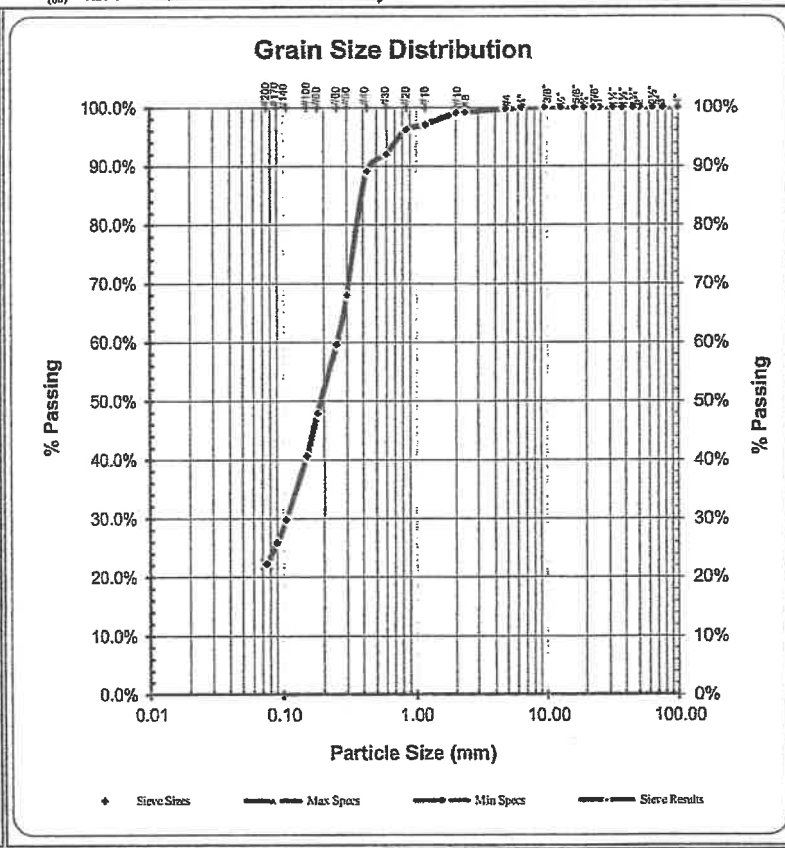
SIEVE ANALYSIS REPORT

Report To: LCU, Inc. Attn: Pat Deneen P.O. Box 394 Cle Elum, WA 98922	Date Sampled: 06/05/18 Date Received: 06/05/18 Date Tested: 06/06/18 Sampled By: WPE Sample Method: Test Pit	Project #: 18413 Sample #: 77 Source: On Site Description: T.P. #2 @ 6"
Specifications: No Specs Sample Meets Specs ? n/a		
ASTM D-2487 Unified Soils Classification System SM: Silty Sand		

Procedure: ASTM C136

$D_{(10)}$ = 0.034 mm	% Gravel = 0.2%	Coeff. of Curvature, C_c = 1.34
$D_{(30)}$ = 0.107 mm	% Sand = 77.5%	Coeff. of Uniformity, C_u = 7.49
$D_{(60)}$ = 0.252 mm	% Silt & Clay = 22.3%	Fineness Modulus = 1.03

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
6.00"	150.00		100%		
4.00"	100.00		100%		
3.00"	75.00		100%		
2.50"	63.00		100%		
2.00"	50.00		100%		
1.75"	45.00		100%		
1.50"	37.50		100%		
1.25"	31.50		100%		
1.00"	25.00		100%		
7/8"	22.40		100%		
3/4"	19.00		100%		
5/8"	16.00		100%		
1/2"	12.50		100%		
3/8"	9.50		100%		
1/4"	6.30	100%	100%		
#4	4.75	100%	100%		
#8	2.360		99%		
#10	2.000	99%	99%		
#16	1.180		97%		
#20	0.850	96%	96%		
#30	0.600		92%		
#40	0.425	89%	89%		
#50	0.300		68%		
#60	0.250		60%		
#80	0.180	48%	48%		
#100	0.150		41%		
#140	0.106		30%		
#170	0.090		26%		
#200	0.075	22.3%	22.3%		



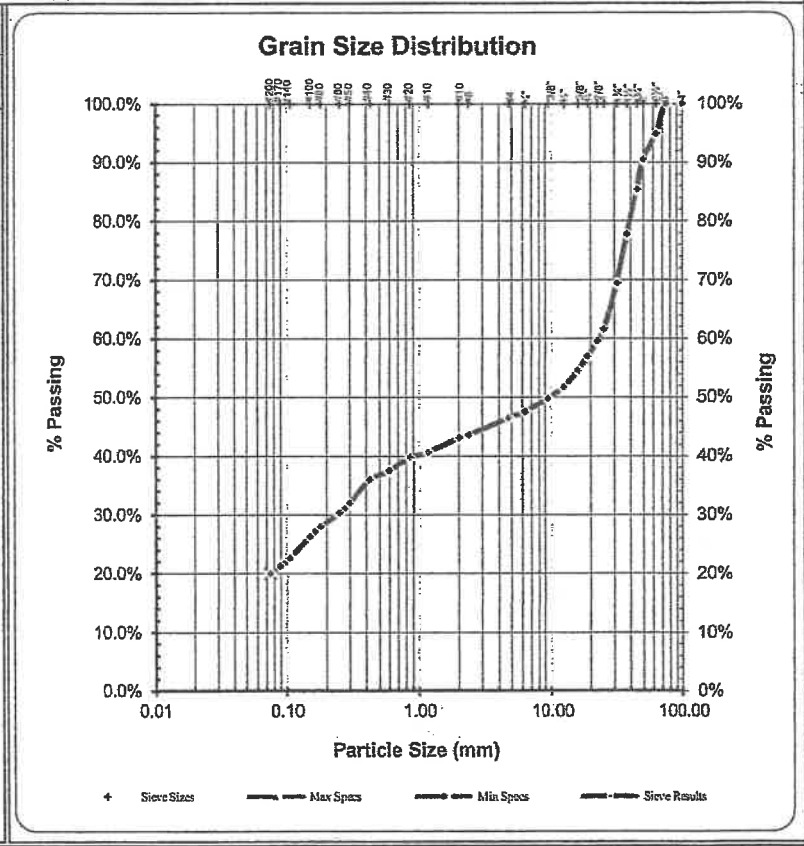
Technician: Jack Demont
 Engineer: Nathan Nofziger, P.E.

These test results relate only to the items tested, and were obtained in-lab unless otherwise specified.
 This report shall not be reproduced, except in full, without the prior written approval of WPES.

SIEVE ANALYSIS REPORT

Report To: LCU, Inc. Attn: Pat Deneen P.O. Box 394 Cle Elum, WA 98922	Date Sampled: 06/05/18 Date Received: 06/05/18 Date Tested: 06/08/18 Sampled By: WPE Sample Method: Test Pit	Project #: 18413 Sample #: 78 Source: On Site Description: T.P. #2 @ 3 ft
Specifications: No Specs Sample Meets Specs ? n/a	ASTM D-2487 Unified Soils Classification System: GM, Silty Gravel with Sand	
Procedure: ASTM C117 Method B	D₍₁₀₎ = 0.037 mm % Gravel = 53.5% D₍₃₀₎ = 0.243 mm % Sand = 26.5% D₍₆₀₎ = 23.057 mm % Silt & Clay = 20.0%	Coeff. of Curvature, C_c = 0.07 Coeff. of Uniformity, C_u = 616.12 Fineness Modulus = 4.89

Sieve Size		Actual Cumulative	Interpolated Cumulative	Specs Max	Specs Min
US	Metric	Percent Passing	Percent Passing		
6.00"	150.00		100%		
4.00"	100.00		100%		
3.00"	75.00	100%	100%		
2.50"	63.00	95%	95%		
2.00"	50.00	90%	90%		
1.75"	45.00		85%		
1.50"	37.50	78%	78%		
1.25"	31.50	69%	69%		
1.00"	25.00	61%	61%		
7/8"	22.40		60%		
3/4"	19.00	57%	57%		
5/8"	16.00		55%		
1/2"	12.50	52%	52%		
3/8"	9.50	50%	50%		
1/4"	6.30	48%	48%		
#4	4.75	47%	47%		
#8	2.360		44%		
#10	2.000	43%	43%		
#16	1.180		41%		
#20	0.850	40%	40%		
#30	0.600		37%		
#40	0.425	36%	36%		
#50	0.300		32%		
#60	0.250		30%		
#80	0.180	28%	28%		
#100	0.150	26%	26%		
#140	0.106		23%		
#170	0.090		21%		
#200	0.075	20.0%	20.0%		



Technician: Jack Demont
 Engineer: Nathan Nofziger, P.E.

These test results relate only to the items tested, and were obtained in-lab unless otherwise specified.
 This report shall not be reproduced, except in full, without the prior written approval of WPES.



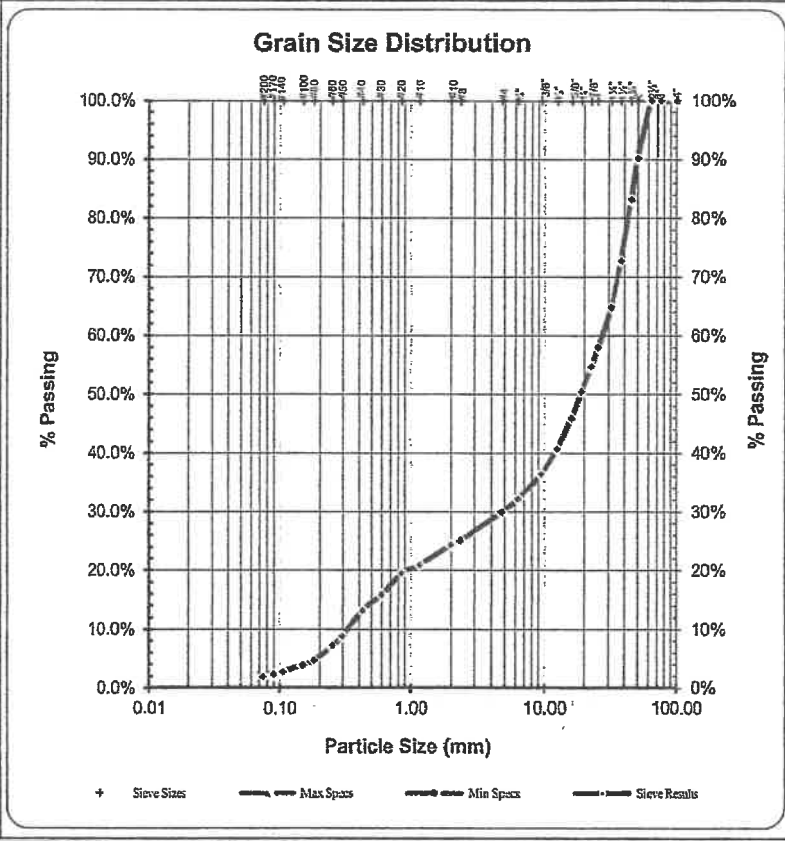
WESTERN PACIFIC ENGINEERING & SURVEY
 1328 E. Hunter Place, Moses Lake, Washington
 T: (509)765-1023 F: (509)765-1298



SIEVE ANALYSIS REPORT

Report To: LCU, Inc. Attn: Pat Deneen P.O. Box 394 Cle Elum, WA 98922	Date Sampled: 06/05/18 Date Received: 06/05/18 Date Tested: 06/08/18 Sampled By: WPE Sample Method: Tset Pit	Project #: 18413 Sample #: 79 Source: On Site Description: T.P. #2 @ 7 ft
Specifications: No Specs Sample Meets Specs? n/a	ASTM D-2487 Unified Soils Classification System GW, Well-graded Gravel with Sand	
Procedure: ASTM C136	$D_{(10)}$ = 0.333 mm % Gravel = 70.1% $D_{(30)}$ = 4.819 mm % Sand = 28.0% $D_{(60)}$ = 26.996 mm % Silt & Clay = 1.9%	Coeff. of Curvature, C_c = 2.59 Coeff. of Uniformity, C_u = 81.19 Fineness Modulus = 6.36

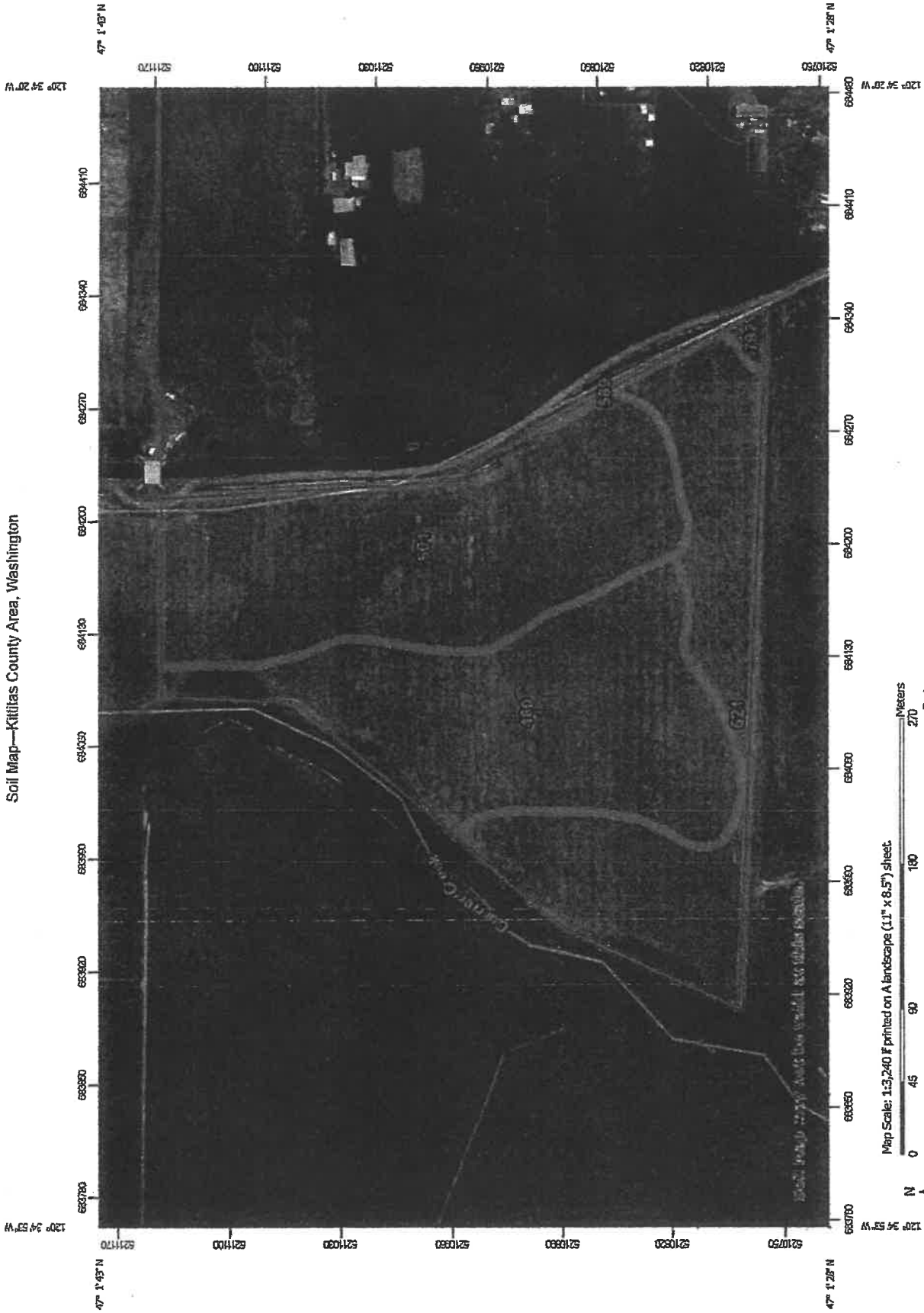
Sieve Size		Actual Cumulative	Interpolated Cumulative	Specs	Specs
US	Metric	Percent Passing	Percent Passing	Max	Min
6.00"	150.00		100%		
4.00"	100.00		100%		
3.00"	75.00		100%		
2.50"	63.00		100%		
2.00"	50.00	90%	90%		
1.75"	45.00		83%		
1.50"	37.50	73%	73%		
1.25"	31.50	65%	65%		
1.00"	25.00	58%	58%		
7/8"	22.40		55%		
3/4"	19.00	50%	50%		
5/8"	16.00		46%		
1/2"	12.50	41%	41%		
3/8"	9.50	36%	36%		
1/4"	6.30	32%	32%		
#4	4.75	30%	30%		
#8	2.360		25%		
#10	2.000	24%	24%		
#16	1.180		21%		
#20	0.850	20%	20%		
#30	0.600		16%		
#40	0.425	13%	13%		
#50	0.300		9%		
#60	0.250		7%		
#80	0.180	5%	5%		
#100	0.150		4%		
#140	0.106		3%		
#170	0.090		2%		
#200	0.075	1.9%	1.9%		



Technician: Jack Demont
 Engineer: Nathan Nofziger, P.E.

These test results relate only to the items tested, and were obtained in-lab unless otherwise specified.
 This report shall not be reproduced, except in full, without the prior written approval of WPES.

Soil Map—Kittitas County Area, Washington



Map Scale: 1:3,240. If printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator. Corner coordinates: WGS84. Edge tics: UTM Zone 10N WGS84.



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

	Area of Interest (AOI)		Spot Area
	Soils		Stony Spot
	Soil Map Unit Polygons		Very Stony Spot
	Soil Map Unit Lines		Wet Spot
	Soil Map Unit Points		Other
	Special Point Features		Special Line Features
	Blowout		
	Borrow Pit		
	Clay Spot		
	Closed Depression		
	Gravel Pit		
	Gravelly Spot		
	Landfill		
	Lava Flow		
	Marsh or swamp		
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		
	Water Features		
	Streams and Canals		
	Transportation		
	Rails		
	Interstate Highways		
	US Routes		
	Major Roads		
	Local Roads		
	Background		
	Aerial Photography		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kittitas County Area, Washington
 Survey Area Data: Version 10, Sep 7, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2014—Sep 21, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
480	Nanum ashy loam, 0 to 2 percent slopes	7.9	34.5%
589	Nack-Brickmill complex, 0 to 5 percent slopes	0.1	0.2%
601	Brickmill gravelly ashy loam, 0 to 2 percent slopes	8.7	37.8%
621	Mitta ashy silt loam, flooded, 0 to 2 percent slopes	6.1	26.8%
792	Brickmill gravelly ashy loam, 0 to 5 percent slopes	0.2	0.7%
Totals for Area of Interest		22.9	100.0%

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (K_{sat}), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (K_{sat}) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (K_{sat}) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (K_w and K_f) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and K_{sat}. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor K_w indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor K_f indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (<http://soils.usda.gov>)

Report—Physical Soil Properties

Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Physical Soil Properties—Kittitas County Area, Washington														
Map symbol and soil name	Depth <i>In</i>	Sand <i>Pct</i>	Silt <i>Pct</i>	Clay <i>Pct</i>	Moist bulk density <i>g/cc</i>	Saturated hydraulic conductivity <i>micro m/sec</i>	Available water capacity <i>In/In</i>	Linear extensibility <i>Pct</i>	Organic matter <i>Pct</i>	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
480—Natum ashy loam, 0 to 2 percent slopes														
Natum	0-8	-39-	-37-	22-25-27	1.15-1.28 -1.40	4.00-9.00-14.00	0.17-0.19-0.20	0.0-1.5-2.9	2.0-3.5-5.0	.24	.24	3	5	58
	8-15	-38-	-36-	25-26-33	1.15-1.28 -1.40	1.40-3.00-4.00	0.17-0.19-0.20	3.0-4.5-5.9	2.0-3.5-5.0	.28	.28			
	15-28	-35-	-34-	27-31-35	1.15-1.28 -1.40	1.40-3.00-4.00	0.15-0.18-0.20	3.0-4.5-5.9	1.0-1.5-2.0	.28	.28			
	28-35	-35-	-34-	27-31-35	1.25-1.33 -1.40	1.40-3.00-4.00	0.08-0.10-0.11	3.0-4.5-5.9	1.0-1.5-2.0	.10	.28			
	35-60	-55-	-14-	27-31-35	1.25-1.33 -1.40	1.40-3.00-4.00	0.07-0.09-0.10	3.0-4.5-5.9	0.0-1.0-2.0	.02	.20			

Physical Soil Properties—Kittitas County Area, Washington

Physical Soil Properties—Kittitas County Area, Washington														
Map symbol and soil name	Depth In	Sand Pct	Silt Pct	Clay Pct	Moist bulk density g/cc	Saturated hydraulic conductivity micro m/sec	Available water capacity In/in	Linear extensibility Pct	Organic matter Pct	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
589—Nack-Brickmill complex, 0 to 5 percent slopes	0-5	-41-	-37-	18-22-25	1.15-1.28 -1.40	4.00-9.00-14.00	0.11-0.13-0.15	0.0-1.5-2.9	2.0-3.0-4.0	.15	.24	2	6	48
	6-15	-35-	-38-	25-28-30	1.15-1.28 -1.40	1.40-3.00-4.00	0.11-0.14-0.16	3.0-4.5-5.9	1.0-2.0-3.0	.32	.32			
	15-60	-53-	-12-	25-35-40	1.30-1.40 -1.50	1.40-3.00-4.00	0.04-0.06-0.08	3.0-4.5-5.9	1.0-1.5-2.0	.02	.17			
Brickmill	0-12	-43-	-40-	15-18-20	1.15-1.28 -1.40	4.00-9.00-14.00	0.07-0.09-0.11	0.0-1.5-2.9	1.0-2.0-3.0	.15	.28	3	5	56
	12-28	-67-	-15-	15-18-20	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.11	0.0-1.5-2.9	0.5-1.3-2.0	.05	.20			
	28-38	-66-	-15-	15-19-25	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.10	0.0-1.5-2.9	0.5-0.8-1.0	.02	.20			
	38-49	-67-	-20-	12-14-15	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.10	0.0-1.5-2.9	0.5-0.8-1.0	.05	.24			
	49-60	-84-	-11-	0-5-10	1.40-1.48 -1.55	42.00-92.00-141.00	0.03-0.04-0.04	0.0-1.5-2.9	0.0-0.3-0.5	.02	.15			

Physical Soil Properties—Kittitas County Area, Washington

Map symbol and soil name	Depth In	Sand Pct	Silt Pct	Clay Pct	Moist bulk density g/cc	Saturated hydraulic conductivity micro m/sec	Available water capacity In/in	Linear extensibility Pct	Organic matter Pct	Erosion factors			Wind erodibility group	Wind erodibility Index
										Kw	Kf	T		
601—Brickmill gravely ashy loam, 0 to 2 percent slopes	0-12	-43-	-40-	15-18-20	1.15-1.28 -1.40	4.00-9.00-14.00	0.07-0.09-0.11	0.0-1.5-2.9	1.0-2.0-3.0	.15	.28	3	5	56
	12-28	-67-	-15-	15-18-20	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.11	0.0-1.5-2.9	0.5-1.3-2.0	.05	.20			
	28-38	-66-	-15-	15-19-25	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.10	0.0-1.5-2.9	0.5-0.8-1.0	.02	.20			
	38-49	-67-	-20-	12-14-15	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.10	0.0-1.5-2.9	0.5-0.8-1.0	.05	.24			
	49-60	-84-	-11-	0-5-10	1.40-1.48 -1.55	42.00-92.00-141.00	0.03-0.04-0.04	0.0-1.5-2.9	0.0-0.3-0.5	.02	.15			
621—Mitta ashy silt loam, flooded, 0 to 2 percent slopes	0-5	-7-	-70-	19-23-25	1.00-1.15 -1.30	4.00-9.00-14.00	0.19-0.20-0.21	0.0-1.5-2.9	3.0-4.0-5.0	.32	.32	5	5	56
Mitta, flooded	6-15	-7-	-70-	19-23-25	1.00-1.15 -1.30	4.00-9.00-14.00	0.19-0.20-0.21	0.0-1.5-2.9	2.0-3.5-5.0	.37	.37			
	15-34	-7-	-70-	19-23-25	1.00-1.15 -1.30	4.00-9.00-14.00	0.19-0.20-0.21	0.0-1.5-2.9	1.0-1.5-2.0	.49	.49			
	34-49	-9-	-64-	25-28-30	1.15-1.28 -1.40	1.40-3.00-4.00	0.17-0.19-0.21	3.0-4.5-5.9	0.5-1.3-2.0	.43	.43			
	49-60	-9-	-64-	25-28-30	1.25-1.33 -1.40	1.40-3.00-4.00	0.17-0.19-0.21	3.0-4.5-5.9	0.0-0.3-0.5	.49	.49			

Physical Soil Properties—Kittitas County Area, Washington														
Map symbol and soil name	Depth In	Sand Pct	Silt Pct	Clay Pct	Moist bulk density g/cc	Saturated hydraulic conductivity micro m/sec	Available water capacity in/in	Linear extensibility Pct	Organic matter Pct	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
792—Brickmill gravelly ash loam, 0 to 5 percent slopes														
Brickmill	0-12	-43-	-40-	15-18-20	1.15-1.28 -1.40	4.00-9.00-14.00	0.07-0.09-0.11	0.0-1.5-2.9	1.0-2.0-3.0	.15	.28	3	5	56
	12-28	-67-	-15-	15-18-20	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.11	0.0-1.5-2.9	0.5-1.3-2.0	.05	.20			
	28-38	-66-	-15-	15-19-25	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.10	0.0-1.5-2.9	0.5-0.8-1.0	.02	.20			
	38-49	-67-	-20-	12-14-15	1.30-1.40 -1.50	4.00-9.00-14.00	0.05-0.08-0.10	0.0-1.5-2.9	0.5-0.8-1.0	.05	.24			
	49-60	-84-	-11-	0-5-10	1.40-1.48 -1.55	42.00-92.00-141.00	0.03-0.04-0.04	0.0-1.5-2.9	0.0-0.3-0.5	.02	.15			

Data Source Information

Soil Survey Area: Kittitas County Area, Washington
 Survey Area Data: Version 10, Sep 7, 2017

Eastern Washington
Stormwater Manual



25-Year 24-Hour Isopleth
Source: NOAA Atlas 2, Volume IX, 1973
Precipitation in inches

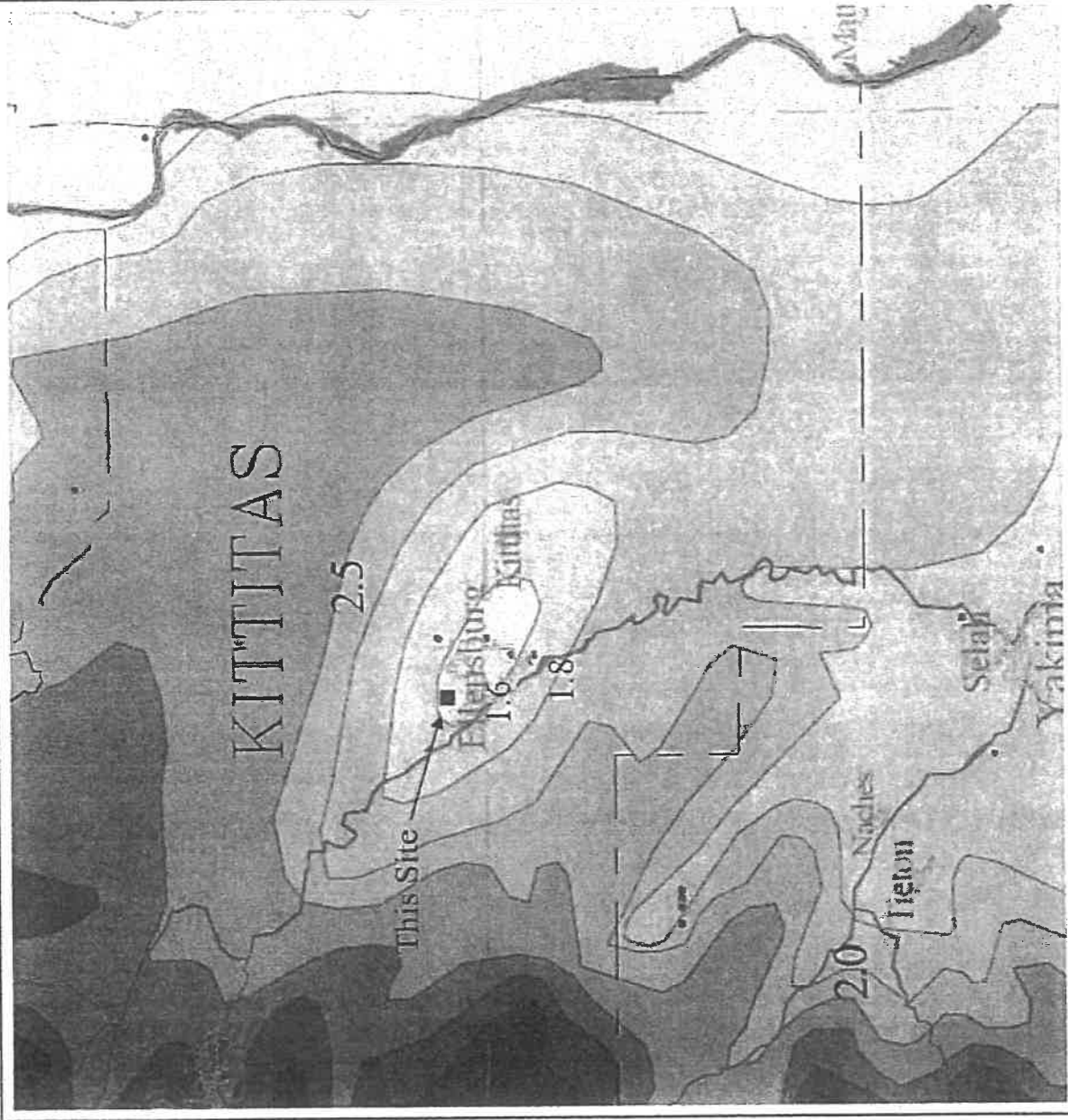
County (2003, 1:24,000)
City (2003, 1:24,000)
Latitude/Longitude (1/10 degree)
Isopleth (1973, 1:2,000,000)
NOAA/NWS Station (1931-1998)



Scale 1:24,000
0 1 2 3 4 5
Water Quality Program



WASHINGTON STATE
DEPARTMENT OF
ECOLOGY
GIS Technical Services
03/25/04
Figure_A3.5



High ground water or shallow bedrock can cause a significant increase in runoff. If either of these conditions exists, it needs to be addressed by the designer. For a more complete discussion of computing weighted CN values, see *Urban Hydrology for Small Watersheds* (USDA, 1986).

Table 4.14: Runoff Curve Numbers (CNs) for Selected Agricultural, Suburban, and Urban Areas

Cover type and hydrologic condition	CNs for hydrologic soil group			
	A	B	C	D
Open space (lawns, parks, golf courses, cemeteries, landscaping, etc.)^a				
Poor condition (grass cover <50% of the area)	68	79	86	89
Fair condition (grass cover on 50% to 75% of the area)	49	69	79	84
Good condition (grass cover on >75% of the area)	39	61	74	80
Impervious areas				
Open water bodies: lakes, wetlands, ponds etc.	100	100	100	100
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)	98	98	98	98
Permeable pavers and permeable interlocking concrete (assumed as 85% impervious and 15% lawn)				
Fair lawn condition (weighted average CNs)	95	96	97	97
Gravel (including right-of-way)	76	85	89	91
Dirt (including right-of-way)	72	82	87	89
Pasture, grassland, or range-continuous forage for grazing				
Poor condition (ground cover <50% or heavily grazed with no mulch)	68	79	86	89
Fair condition (ground cover 50% to 75% and not heavily grazed)	49	69	79	84
Good condition (ground cover >75% and lightly or only occasionally grazed)	39	61	74	80
Cultivated agricultural lands				
Row Crops (good) e.g., corn, sugar beets, soy beans	64	75	82	85
Small Grain (good) e.g., wheat, barley, flax	60	72	80	84
Meadow				
Continuous grass, protected from grazing and generally mowed for hay	30	58	71	78
Brush (brush-weed-grass mixture with brush the major element)				

Table 4.14: Runoff Curve Numbers (CNs) for Selected Agricultural, Suburban, and Urban Areas (continued)

Cover type and hydrologic condition	CNs for hydrologic soil group			
	A	B	C	D
Poor (<50% ground cover)	48	67	77	83
Fair (50% to 75% ground cover)	35	56	70	77
Good (>75% ground cover)	30 ^b	48	65	73
Woods-grass combination (orchard or tree farm)^c				
Poor	57	73	82	86
Fair	43	65	76	82
Good	32	58	72	79
Woods				
Poor (Forest litter, small trees, and brush destroyed by heavy grazing or regular burning)	45	66	77	83
Fair (Woods are grazed but not burned, and some forest litter covers the soil)	36	60	73	79
Good (Woods are protected from grazing, and litter and brush adequately cover the soil)	30	55	70	77
Herbaceous (mixture of grass, weeds, and low-growing brush, with brush the minor element)				
Poor (<30% ground cover)	n/a ^d	80	87	93
Fair (30% to 70% ground cover)		71	81	89
Good (>70% ground cover)		62	74	85
Sagebrush with grass understory				
Poor (<30% ground cover)	n/a ^d	67	80	85
Fair (30% to 70% ground cover)		51	63	70
Good (>70% ground cover)		35	47	55
^a Composite CNs may be computed for other combinations of open space cover type. ^b Actual CN is < 30; use CN = 30 for runoff computations. ^c The indicated CNs were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CNs for woods and pasture. ^d CNs have not been developed for hydrologic soil group A.				

Stormwater Area Calcs - Left Ditch

Length of Roadway	3250	ft
Width of Roadway	13	ft
Lots Left	24	units
Width of Driveway	20	ft
Left Ditch Length	2110.0	ft
Shoulder Width	3	ft
Ditch Right Width	6	ft
Ditch Left Width	4.5	ft

Impervious Area	48730	sq. ft.	1.118	ac
Pervious Area	28485	sq. ft.	0.654	ac
Total Area	77215	sq. ft.	1.772	ac

Infiltration Area	6330	sq. ft.
Storage Volume	527.5	cu. ft.
Assumed Depth	2	inches

Stormwater Area Calcs - Right Ditch

Length of Roadway	3250	ft
Width of Roadway	13	ft
Lots Right	22	units
Width of Driveway	20	ft
Right Ditch Length	2410.0	ft
Shoulder Width	3	ft
Ditch Right Width	6	ft
Ditch Left Width	4.5	ft

Impervious Area	48190	sq. ft.	1.106	ac
Pervious Area	32535	sq. ft.	0.747	ac
Total Area	80725	sq. ft.	1.852	ac

Infiltration Area	7230	sq. ft.
Storage Volume	602.5	cu. ft.
Assumed Depth	2	inches

SCS Type 1A Regional Storm - Central Basin
Stormwater Runoff Area - Left Ditch

Area (acres) = 1.772 P (inches) = 1.6 d_c (min) = 6 T_c (min) = 5 Infiltration Area (ft²) = 6330.0
 W_p = 0.375 Max Storage (cu. ft.) = 556.6
 Pervious Area (acres) = 0.654 CN = 87 S = 1.49 0.2S = 0.30 Infiltration Rate (d/min)(ft²) = 0.0018
 Impervious Area (acres) = 1.118 CN = 58 S = 0.20 0.2S = 0.04 Total Disp = 68.364000

1	2.0	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Time	Time	Time	Rainfall	Incremental	Accum.	Pervious	Pervious	Impervious	Impervious	Total	Instant	Design	Incremental	Drywell	Accum.
Increment	Hours	(min)	Distribution	Rainfall	Rainfall	Acc. Run	Inc. Run	Acc. Run	Inc. Run	Runoff	Flow	Flow	Flow	Disp. Volume	Storage
			(Fraction)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(cfs)	(cfs)	(cf)	(cf)
1	0.0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0
2	0.1	6	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
3	0.2	12	0.002	0.003	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
4	0.3	18	0.002	0.003	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
5	0.4	24	0.002	0.003	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
6	0.5	30	0.002	0.003	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
7	0.6	36	0.002	0.003	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
8	0.7	42	0.002	0.003	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
9	0.8	48	0.002	0.003	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
10	0.9	54	0.002	0.003	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
11	1.0	60	0.002	0.003	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
12	1.1	66	0.003	0.005	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
13	1.2	72	0.003	0.005	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000
14	1.3	78	0.003	0.005	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.2	0.2274
15	1.4	84	0.003	0.005	0.051	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.8	0.8174
16	1.5	90	0.003	0.005	0.056	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	1.6	1.5782
17	1.6	96	0.003	0.005	0.061	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	2.3	2.3419
18	1.7	102	0.003	0.005	0.066	0.000	0.000	0.003	0.001	0.001	0.010	0.009	0.009	3.1	3.0697
19	1.8	108	0.003	0.005	0.070	0.000	0.000	0.004	0.001	0.001	0.012	0.010	0.010	3.8	3.7552
20	1.9	114	0.003	0.005	0.075	0.000	0.000	0.005	0.001	0.001	0.014	0.012	0.012	4.4	4.3994
21	2.0	120	0.003	0.005	0.080	0.000	0.000	0.006	0.001	0.001	0.015	0.015	0.015	5.0	5.0049
22	2.1	126	0.003	0.005	0.085	0.000	0.000	0.008	0.001	0.001	0.017	0.015	0.015	5.6	5.5748
23	2.2	132	0.003	0.005	0.090	0.000	0.000	0.009	0.002	0.001	0.018	0.017	0.017	6.1	6.1116
24	2.3	138	0.004	0.006	0.096	0.000	0.000	0.012	0.002	0.001	0.020	0.021	0.021	7.5	7.5348
25	2.4	144	0.005	0.005	0.101	0.000	0.000	0.014	0.002	0.001	0.021	0.023	0.023	8.3	8.2970
26	2.5	150	0.003	0.005	0.106	0.000	0.000	0.016	0.002	0.001	0.022	0.022	0.022	8.0	7.9550
27	2.6	156	0.003	0.005	0.110	0.000	0.000	0.018	0.002	0.001	0.023	0.023	0.023	8.2	8.1785
28	2.7	162	0.003	0.005	0.115	0.000	0.000	0.020	0.002	0.001	0.025	0.024	0.024	8.5	8.5272
29	2.8	168	0.004	0.006	0.122	0.000	0.000	0.023	0.003	0.002	0.026	0.028	0.028	10.1	10.0704
30	2.9	174	0.003	0.005	0.126	0.000	0.000	0.025	0.002	0.001	0.027	0.030	0.030	10.8	10.7615
31	3.0	180	0.003	0.005	0.131	0.000	0.000	0.028	0.002	0.002	0.028	0.028	0.028	10.0	10.0463
32	3.1	186	0.003	0.005	0.136	0.000	0.000	0.030	0.003	0.002	0.029	0.028	0.028	10.1	10.1021
33	3.2	192	0.003	0.005	0.141	0.000	0.000	0.033	0.003	0.002	0.029	0.029	0.029	10.3	10.3395
34	3.3	198	0.003	0.005	0.146	0.000	0.000	0.036	0.003	0.002	0.030	0.029	0.029	10.6	10.6118
35	3.4	204	0.004	0.006	0.152	0.000	0.000	0.039	0.004	0.002	0.031	0.034	0.034	12.3	12.2923
36	3.5	210	0.003	0.005	0.157	0.000	0.000	0.042	0.003	0.002	0.032	0.036	0.036	12.9	12.9369
37	3.6	216	0.003	0.005	0.162	0.000	0.000	0.045	0.003	0.002	0.032	0.033	0.033	11.9	11.9030
38	3.7	222	0.004	0.006	0.168	0.000	0.000	0.048	0.004	0.002	0.034	0.037	0.037	13.3	13.3261
39	3.8	228	0.004	0.006	0.174	0.000	0.000	0.053	0.004	0.003	0.035	0.043	0.043	15.4	15.4161
40	3.9	234	0.003	0.005	0.179	0.000	0.000	0.056	0.003	0.002	0.035	0.041	0.041	14.6	14.6411
41	4.0	240	0.004	0.006	0.186	0.000	0.000	0.060	0.004	0.003	0.037	0.041	0.041	14.7	14.6789
42	4.1	246	0.004	0.006	0.192	0.000	0.000	0.064	0.004	0.003	0.038	0.046	0.046	16.5	16.4812
43	4.2	252	0.003	0.005	0.197	0.000	0.000	0.068	0.003	0.002	0.036	0.043	0.043	15.5	15.5138
44	4.3	258	0.004	0.006	0.203	0.000	0.000	0.072	0.004	0.003	0.038	0.043	0.043	15.5	15.4707
45	4.4	264	0.004	0.006	0.210	0.000	0.000	0.076	0.004	0.003	0.039	0.048	0.048	17.3	17.3045
46	4.5	270	0.004	0.006	0.216	0.000	0.000	0.081	0.005	0.003	0.041	0.051	0.051	18.0	17.9887
47	4.6	276	0.004	0.006	0.222	0.000	0.000	0.085	0.005	0.003	0.042	0.051	0.051	18.3	18.3302
48	4.7	282	0.004	0.006	0.229	0.000	0.000	0.090	0.005	0.003	0.043	0.052	0.052	18.6	18.6053
49	4.8	288	0.004	0.006	0.235	0.000	0.000	0.095	0.005	0.003	0.044	0.052	0.052	18.9	18.8521
50	4.9	294	0.005	0.008	0.243	0.000	0.000	0.101	0.006	0.004	0.046	0.058	0.058	20.9	20.9005
51	5.0	300	0.004	0.006	0.250	0.000	0.000	0.106	0.005	0.003	0.047	0.059	0.059	21.6	21.5920
52	5.1	306	0.005	0.008	0.258	0.000	0.000	0.112	0.006	0.004	0.049	0.061	0.061	22.0	21.9774
53	5.2	312	0.004	0.006	0.264	0.000	0.000	0.117	0.005	0.003	0.050	0.062	0.062	22.2	22.2352
54	5.3	318	0.005	0.008	0.272	0.000	0.000	0.123	0.006	0.004	0.051	0.062	0.062	22.5	22.4913
55	5.4	324	0.005	0.008	0.280	0.000	0.000	0.129	0.005	0.004	0.052	0.068	0.068	24.6	24.6180
56	5.5	330	0.005	0.008	0.288	0.000	0.000	0.135	0.006	0.004	0.053	0.071	0.070	25.3	25.3413
57	5.6	336	0.005	0.008	0.295	0.000	0.000	0.142	0.006	0.004	0.054	0.071	0.071	25.7	25.7036
58	5.7	342	0.005	0.008	0.304	0.000	0.000	0.148	0.006	0.004	0.055	0.073	0.072	26.0	25.9821
59	5.8	348	0.005	0.008	0.312	0.000	0.000	0.155	0.006	0.004	0.056	0.073	0.073	26.3	26.3014
60	5.9	354	0.005	0.008	0.320	0.000	0.000	0.161	0.008	0.004	0.057	0.074	0.074	26.7	26.6813
61	6.0	360	0.006	0.010	0.330	0.001	0.000	0.169	0.008	0.005	0.059	0.081	0.081	29.1	29.1427
62	6.1	366	0.005	0.010	0.339	0.001	0.000	0.177	0.008	0.005	0.060	0.089	0.089	32.2	32.1756
63	6.2	372	0.006	0.010	0.349	0.002	0.001	0.185	0.008	0.005	0.061	0.094	0.093	33.3	33.3263
64	6.3	378	0.006	0.010	0.358	0.002	0.001	0.193	0.008	0.005	0.062	0.094	0.094	34.0	33.9985
65	6.4	384	0.007	0.011	0.370	0.003	0.001	0.203	0.010	0.006	0.113	0.102	0.102	35.7	35.7314
66	6.5	390	0.006	0.010	0.379	0.004	0.001	0.211	0.009	0.006	0.099	0.105	0.105	37.8	37.7973
67	6.6	396	0.006	0.010	0.389	0.005	0.001	0.219	0.009	0.006	0.100	0.101	0.101	38.2	38.2318
68	6.7	402	0.006	0.010	0.398	0.006	0.001	0.228	0.009	0.006	0.101	0.100	0.100	38.2	38.1691
69	6.8	408	0.006	0.010	0.408	0.007	0.001	0.236	0.009	0.006	0.102	0.101	0.101	38.5	38.4715
70	6.9	414	0.005	0.010	0.418	0.009	0.001	0.244	0.009	0.006	0.103	0.102	0.102	38.9	38.8551
71	7.0	420	0.007	0.011	0.429	0.010	0.002	0.254	0.010	0.007	0.122	0.110	0.110	39.6	39.6120
72	7.1	426	0.007	0.011	0.440	0.012	0.002	0.264	0.010	0.007	0.123	0.119	0.119	43.0	43.0038
73	7.2	432	0.008	0.013	0.453	0.014	0.002	0.276	0.011	0.008	0.143	0.130	0.130		

85	8.4	504	0.010	0.016	0.755	0.107	0.007	0.556	0.015	0.012	0.214	0.226	81.2	68.3640	551.1
86	8.5	510	0.008	0.013	0.768	0.112	0.005	0.568	0.012	0.010	0.172	0.201	72.5	68.3640	555.3
87	8.6	516	0.009	0.014	0.782	0.118	0.006	0.582	0.014	0.011	0.195	0.188	67.7	67.7418	555.3
88	8.7	522	0.009	0.014	0.797	0.124	0.006	0.595	0.014	0.011	0.196	0.194	69.7	68.3540	556.6
89	8.8	528	0.007	0.011	0.808	0.129	0.005	0.606	0.011	0.009	0.153	0.179	64.6	64.5733	556.6
90	8.9	534	0.008	0.013	0.821	0.135	0.006	0.618	0.012	0.010	0.176	0.168	60.5	60.5474	556.6
91	9.0	540	0.007	0.011	0.832	0.140	0.005	0.629	0.011	0.009	0.154	0.165	59.7	59.7090	556.6
92	9.1	546	0.007	0.011	0.843	0.145	0.005	0.640	0.011	0.009	0.155	0.157	56.7	56.6926	556.6
93	9.2	552	0.006	0.010	0.853	0.150	0.004	0.649	0.009	0.007	0.133	0.147	53.1	53.0851	556.6
94	9.3	558	0.006	0.010	0.862	0.154	0.005	0.659	0.009	0.007	0.134	0.137	49.3	49.3077	556.6
95	9.4	564	0.006	0.010	0.872	0.159	0.005	0.667	0.009	0.008	0.134	0.135	48.5	48.4700	556.6
96	9.5	570	0.005	0.008	0.880	0.163	0.004	0.675	0.008	0.006	0.112	0.126	45.3	45.3369	556.6
97	9.6	576	0.006	0.010	0.890	0.167	0.005	0.684	0.009	0.008	0.135	0.124	44.6	44.8483	556.6
98	9.7	582	0.005	0.008	0.898	0.171	0.004	0.692	0.008	0.006	0.113	0.124	44.6	44.5538	556.6
99	9.8	588	0.006	0.010	0.907	0.176	0.005	0.701	0.009	0.008	0.135	0.124	44.6	44.6220	556.6
100	9.9	594	0.005	0.008	0.915	0.180	0.004	0.709	0.008	0.006	0.113	0.124	44.7	44.7145	556.6
101	10.0	600	0.005	0.008	0.923	0.184	0.004	0.717	0.008	0.006	0.113	0.116	41.8	41.7611	556.6
102	10.1	606	0.005	0.008	0.931	0.188	0.004	0.724	0.008	0.006	0.114	0.114	41.1	41.0894	556.6
103	10.2	612	0.005	0.008	0.939	0.192	0.004	0.732	0.008	0.006	0.114	0.114	41.0	40.9872	556.6
104	10.3	618	0.005	0.008	0.947	0.196	0.004	0.740	0.008	0.006	0.114	0.114	41.0	41.0265	556.6
105	10.4	624	0.004	0.006	0.954	0.199	0.003	0.746	0.006	0.005	0.091	0.105	38.0	38.0103	556.6
106	10.5	630	0.005	0.008	0.962	0.204	0.004	0.754	0.008	0.006	0.115	0.104	37.3	37.3131	556.6
107	10.6	636	0.005	0.008	0.970	0.208	0.004	0.761	0.008	0.006	0.115	0.112	40.3	40.2851	556.6
108	10.7	642	0.004	0.006	0.976	0.211	0.003	0.768	0.006	0.005	0.092	0.106	38.0	37.9825	556.6
109	10.8	648	0.005	0.008	0.984	0.215	0.004	0.775	0.008	0.006	0.115	0.104	37.5	37.4617	556.6
110	10.9	654	0.005	0.008	0.992	0.220	0.004	0.783	0.008	0.006	0.115	0.112	40.5	40.4930	556.6
111	11.0	660	0.004	0.006	0.998	0.223	0.003	0.789	0.006	0.005	0.092	0.105	38.2	38.1864	556.6
112	11.1	666	0.004	0.006	1.005	0.227	0.003	0.796	0.006	0.005	0.093	0.096	34.5	34.5340	556.6
113	11.2	672	0.005	0.008	1.013	0.231	0.004	0.803	0.008	0.006	0.116	0.102	36.8	36.7915	556.6
114	11.3	678	0.004	0.006	1.019	0.234	0.003	0.810	0.006	0.005	0.093	0.104	37.4	37.3973	556.6
115	11.4	684	0.004	0.006	1.026	0.238	0.003	0.816	0.006	0.005	0.093	0.096	34.5	34.4568	556.6
116	11.5	690	0.004	0.006	1.032	0.241	0.004	0.822	0.006	0.005	0.093	0.094	33.8	33.7574	556.6
117	11.6	696	0.004	0.006	1.039	0.245	0.004	0.828	0.006	0.005	0.093	0.093	33.6	33.6184	556.6
118	11.7	702	0.004	0.006	1.045	0.248	0.004	0.834	0.006	0.005	0.093	0.093	33.6	33.6190	556.6
119	11.8	708	0.004	0.006	1.051	0.252	0.004	0.841	0.006	0.005	0.094	0.093	33.7	33.6542	556.6
120	11.9	714	0.003	0.005	1.056	0.255	0.003	0.845	0.005	0.004	0.070	0.085	30.5	30.5334	556.6
121	12.0	720	0.004	0.006	1.062	0.258	0.004	0.851	0.005	0.005	0.094	0.083	29.8	29.7833	556.6
122	12.1	726	0.004	0.006	1.069	0.262	0.004	0.856	0.006	0.005	0.094	0.091	32.8	32.7899	556.6
123	12.2	732	0.003	0.005	1.074	0.265	0.003	0.862	0.005	0.004	0.071	0.084	30.4	30.3594	556.6
124	12.3	738	0.004	0.006	1.080	0.268	0.004	0.869	0.006	0.005	0.094	0.083	29.8	29.8311	556.6
125	12.4	744	0.004	0.006	1.086	0.272	0.004	0.875	0.006	0.005	0.094	0.091	32.9	32.8939	556.6
126	12.5	750	0.004	0.006	1.093	0.275	0.004	0.881	0.006	0.005	0.094	0.094	33.7	33.8925	556.6
127	12.6	756	0.004	0.006	1.099	0.279	0.004	0.887	0.006	0.005	0.095	0.094	33.9	33.9247	556.6
128	12.7	762	0.003	0.005	1.104	0.282	0.003	0.892	0.005	0.004	0.071	0.086	30.8	30.8198	556.6
129	12.8	768	0.004	0.006	1.110	0.286	0.004	0.898	0.006	0.005	0.095	0.084	30.1	30.0716	556.6
130	12.9	774	0.003	0.005	1.115	0.288	0.003	0.903	0.005	0.004	0.071	0.083	29.9	29.9054	556.6
131	13.0	780	0.004	0.006	1.122	0.292	0.004	0.909	0.006	0.005	0.095	0.083	29.9	29.8914	556.6
132	13.1	786	0.004	0.006	1.128	0.296	0.004	0.915	0.006	0.005	0.095	0.082	33.1	33.1173	556.6
133	13.2	792	0.003	0.005	1.133	0.299	0.003	0.920	0.005	0.004	0.071	0.085	30.7	30.7419	556.6
134	13.3	798	0.004	0.006	1.139	0.302	0.004	0.926	0.006	0.005	0.095	0.084	30.2	30.1749	556.6
135	13.4	804	0.004	0.006	1.146	0.306	0.004	0.933	0.006	0.005	0.095	0.082	33.3	33.2726	556.6
136	13.5	810	0.003	0.005	1.150	0.309	0.003	0.937	0.005	0.004	0.072	0.086	30.9	30.8540	556.6
137	13.6	816	0.003	0.005	1.155	0.312	0.003	0.942	0.005	0.004	0.072	0.075	27.0	27.0496	556.6
138	13.7	822	0.004	0.006	1.162	0.316	0.004	0.949	0.006	0.005	0.096	0.082	29.3	29.3439	556.6
139	13.8	828	0.003	0.005	1.166	0.319	0.003	0.953	0.005	0.004	0.072	0.083	29.9	29.9368	556.6
140	13.9	834	0.004	0.006	1.173	0.323	0.004	0.959	0.006	0.005	0.096	0.084	30.1	30.1106	556.6
141	14.0	840	0.003	0.005	1.178	0.325	0.003	0.964	0.005	0.004	0.072	0.084	30.1	30.1731	556.6
142	14.1	846	0.003	0.005	1.182	0.328	0.003	0.968	0.005	0.004	0.072	0.075	27.0	26.9726	556.6
143	14.2	852	0.004	0.006	1.189	0.332	0.004	0.975	0.006	0.005	0.086	0.086	29.4	29.4325	556.6
144	14.3	858	0.003	0.005	1.194	0.335	0.003	0.979	0.005	0.004	0.072	0.084	30.1	30.0861	556.6
145	14.4	864	0.003	0.005	1.198	0.338	0.003	0.984	0.005	0.004	0.072	0.075	27.0	26.9990	556.6
146	14.5	870	0.004	0.006	1.205	0.342	0.004	0.990	0.006	0.005	0.096	0.082	29.5	29.5007	556.6
147	14.6	876	0.003	0.005	1.210	0.345	0.003	0.995	0.005	0.004	0.072	0.084	30.1	30.1443	556.6
148	14.7	882	0.003	0.005	1.214	0.348	0.003	1.000	0.005	0.004	0.072	0.075	27.1	27.0705	556.6
149	14.8	888	0.004	0.006	1.221	0.352	0.004	1.006	0.006	0.005	0.097	0.082	29.6	29.5787	556.6
150	14.9	894	0.003	0.005	1.226	0.355	0.003	1.011	0.005	0.004	0.073	0.084	30.2	30.2236	556.6
151	15.0	900	0.003	0.005	1.230	0.359	0.003	1.015	0.005	0.004	0.073	0.075	27.1	27.1412	556.6
152	15.1	906	0.003	0.005	1.235	0.361	0.003	1.020	0.005	0.004	0.073	0.073	26.4	26.3857	556.6
153	15.2	912	0.004	0.006	1.242	0.365	0.004	1.026	0.006	0.005	0.097	0.082	29.5	29.4839	556.6
154	15.3	918	0.003	0.005	1.246	0.368	0.003	1.031	0.005	0.004	0.073	0.084	30.3	30.2757	556.6
155	15.4	924	0.003	0.005	1.251	0.371	0.003	1.036	0.005	0.004	0.073	0.076	27.2	27.2187	556.6
156	15.5	930	0.003	0.005	1.256	0.374	0.003	1.040	0.005	0.004	0.073	0.074	26.5	26.4891	556.6
157	15.6	936	0.003	0.005	1.261	0.377	0.003	1.045	0.005	0.004	0.073	0.073	26.3	26.2962	556.6
158	15.7	942	0.004	0.006	1.267	0.381	0.004	1.051	0.006	0.005	0.097	0.082	29.6	29.5524	556.6
159	15.8	948	0.003	0.005	1.272	0.384	0.003	1.056	0.005	0.004	0.073	0.084	30.4	30.3832	556.6
160	15.9	954	0.003	0.005	1.277	0.387	0.003	1.061	0.005	0.004	0.073	0.076	27.3	27.3225	556.6
161	16.0	960	0.003	0.005	1.282	0.390	0.003	1.066	0.005	0.004	0.073	0.074	26.6	2	

183	18.2	1092	0.002	0.003	1.384	0.457	0.002	1.166	0.003	0.003	0.049	0.065	23.3	23.3402	556.6
184	18.3	1098	0.003	0.005	1.389	0.460	0.003	1.171	0.005	0.004	0.074	0.063	22.5	22.5319	556.6
185	18.4	1104	0.003	0.005	1.394	0.463	0.003	1.176	0.005	0.004	0.074	0.071	25.7	25.6794	556.6
186	18.5	1110	0.003	0.005	1.398	0.466	0.003	1.180	0.005	0.004	0.074	0.074	26.5	26.4784	556.6
187	18.6	1116	0.002	0.003	1.402	0.469	0.002	1.183	0.003	0.003	0.050	0.065	23.3	23.3434	556.6
188	18.7	1122	0.003	0.005	1.406	0.471	0.003	1.188	0.005	0.004	0.074	0.063	22.6	22.5697	556.6
189	18.8	1128	0.003	0.005	1.411	0.475	0.003	1.193	0.005	0.004	0.074	0.071	25.7	25.7330	556.6
190	18.9	1134	0.002	0.003	1.414	0.477	0.002	1.196	0.003	0.003	0.050	0.064	23.2	23.1836	556.6
191	19.0	1140	0.003	0.005	1.419	0.480	0.003	1.201	0.005	0.004	0.075	0.063	22.6	22.5562	556.6
192	19.1	1146	0.003	0.005	1.424	0.483	0.003	1.205	0.005	0.004	0.075	0.072	25.8	25.7611	556.6
193	19.2	1152	0.002	0.003	1.427	0.485	0.002	1.208	0.003	0.003	0.050	0.064	23.2	23.2168	556.6
194	19.3	1158	0.003	0.005	1.432	0.489	0.003	1.213	0.005	0.004	0.075	0.063	22.6	22.5994	556.6
195	19.4	1164	0.002	0.003	1.435	0.491	0.002	1.216	0.003	0.003	0.050	0.062	22.4	22.4403	556.6
196	19.5	1170	0.003	0.005	1.440	0.494	0.003	1.221	0.005	0.004	0.075	0.062	22.4	22.4123	556.6
197	19.6	1176	0.003	0.005	1.445	0.497	0.003	1.226	0.005	0.004	0.075	0.072	25.8	25.7753	556.6
198	19.7	1182	0.002	0.003	1.448	0.500	0.002	1.229	0.003	0.003	0.050	0.065	23.3	23.2619	556.6
199	19.8	1188	0.003	0.005	1.453	0.503	0.003	1.234	0.005	0.004	0.075	0.063	22.6	22.6430	556.6
200	19.9	1194	0.002	0.003	1.456	0.505	0.002	1.237	0.003	0.003	0.050	0.062	22.5	22.4946	556.6
201	20.0	1200	0.003	0.005	1.461	0.508	0.003	1.242	0.005	0.004	0.075	0.062	22.5	22.4668	556.6
202	20.1	1206	0.002	0.003	1.464	0.510	0.002	1.245	0.003	0.003	0.050	0.062	22.5	22.4661	556.6
203	20.2	1212	0.003	0.005	1.469	0.514	0.003	1.249	0.005	0.004	0.075	0.062	22.5	22.4762	556.6
204	20.3	1218	0.002	0.003	1.472	0.516	0.002	1.253	0.003	0.003	0.050	0.062	22.5	22.4836	556.6
205	20.4	1224	0.002	0.003	1.475	0.518	0.002	1.256	0.003	0.003	0.050	0.053	19.1	19.1189	556.6
206	20.5	1230	0.003	0.005	1.480	0.521	0.003	1.260	0.005	0.004	0.075	0.060	21.7	21.6598	556.6
207	20.6	1236	0.002	0.003	1.483	0.524	0.002	1.264	0.003	0.003	0.050	0.062	22.3	22.3011	556.6
208	20.7	1242	0.003	0.005	1.488	0.527	0.003	1.268	0.005	0.004	0.075	0.062	22.5	22.4704	556.6
209	20.8	1248	0.002	0.003	1.491	0.529	0.002	1.271	0.003	0.003	0.050	0.053	22.5	22.5188	556.6
210	20.9	1254	0.002	0.003	1.494	0.531	0.002	1.275	0.003	0.003	0.050	0.053	19.2	19.1566	556.6
211	21.0	1260	0.003	0.005	1.499	0.535	0.003	1.279	0.005	0.004	0.075	0.060	21.7	21.7053	556.6
212	21.1	1266	0.002	0.003	1.502	0.537	0.002	1.283	0.003	0.003	0.050	0.062	22.3	22.3483	556.6
213	21.2	1272	0.002	0.003	1.506	0.539	0.002	1.286	0.003	0.003	0.050	0.053	19.1	19.1306	556.6
214	21.3	1278	0.003	0.005	1.510	0.542	0.003	1.290	0.005	0.004	0.075	0.060	21.7	21.7194	556.6
215	21.4	1284	0.002	0.003	1.514	0.545	0.002	1.294	0.003	0.003	0.050	0.062	22.4	22.3724	556.6
216	21.5	1290	0.002	0.003	1.517	0.547	0.002	1.297	0.003	0.003	0.050	0.053	19.2	19.1530	556.6
217	21.6	1296	0.003	0.005	1.522	0.550	0.003	1.301	0.005	0.004	0.075	0.060	21.7	21.7453	556.6
218	21.7	1302	0.002	0.003	1.525	0.553	0.002	1.305	0.003	0.003	0.050	0.062	22.4	22.3992	556.6
219	21.8	1308	0.002	0.003	1.528	0.555	0.002	1.308	0.003	0.003	0.050	0.053	19.2	19.1758	556.6
220	21.9	1314	0.002	0.003	1.531	0.557	0.002	1.311	0.003	0.003	0.050	0.051	18.4	18.3746	556.6
221	22.0	1320	0.002	0.003	1.534	0.559	0.002	1.314	0.003	0.003	0.050	0.050	18.2	18.1788	556.6
222	22.1	1326	0.003	0.005	1.539	0.563	0.003	1.319	0.005	0.004	0.076	0.060	21.5	21.5333	556.6
223	22.2	1332	0.002	0.003	1.542	0.565	0.002	1.322	0.003	0.003	0.050	0.062	22.4	22.3775	556.6
224	22.3	1338	0.002	0.003	1.546	0.567	0.002	1.325	0.003	0.003	0.050	0.053	19.2	19.1954	556.6
225	22.4	1344	0.002	0.003	1.549	0.569	0.002	1.328	0.003	0.003	0.050	0.051	18.4	18.4043	556.6
226	22.5	1350	0.002	0.003	1.552	0.572	0.002	1.331	0.003	0.003	0.050	0.051	18.2	18.2110	556.6
227	22.6	1356	0.002	0.003	1.555	0.574	0.002	1.335	0.003	0.003	0.050	0.050	18.2	18.1672	556.6
228	22.7	1362	0.002	0.003	1.558	0.576	0.002	1.338	0.003	0.003	0.050	0.050	18.2	18.1606	556.6
229	22.8	1368	0.002	0.003	1.562	0.578	0.002	1.341	0.003	0.003	0.050	0.050	18.2	18.1634	556.6
230	22.9	1374	0.002	0.003	1.565	0.581	0.002	1.344	0.003	0.003	0.050	0.050	18.2	18.1685	556.6
231	23.0	1380	0.002	0.003	1.568	0.583	0.002	1.347	0.003	0.003	0.050	0.050	18.2	18.1741	556.6
232	23.1	1386	0.002	0.003	1.571	0.585	0.002	1.350	0.003	0.003	0.051	0.050	18.2	18.1799	556.6
233	23.2	1392	0.002	0.003	1.574	0.587	0.002	1.353	0.003	0.003	0.051	0.051	18.2	18.1857	556.6
234	23.3	1398	0.002	0.003	1.578	0.590	0.002	1.357	0.003	0.003	0.051	0.051	18.2	18.1915	556.6
235	23.4	1404	0.002	0.003	1.581	0.592	0.002	1.360	0.003	0.003	0.051	0.051	18.2	18.1973	556.6
236	23.5	1410	0.002	0.003	1.584	0.594	0.002	1.363	0.003	0.003	0.051	0.051	18.2	18.2030	556.6
237	23.6	1416	0.002	0.003	1.587	0.597	0.002	1.366	0.003	0.003	0.051	0.051	18.2	18.2087	556.6
238	23.7	1422	0.002	0.003	1.590	0.599	0.002	1.369	0.003	0.003	0.051	0.051	18.2	18.2144	556.6
239	23.8	1428	0.002	0.003	1.594	0.601	0.002	1.372	0.003	0.003	0.051	0.051	18.2	18.2201	556.6
240	23.9	1434	0.002	0.003	1.597	0.603	0.002	1.376	0.003	0.003	0.051	0.051	18.2	18.2258	556.6
241	24.0	1440	0.002	0.003	1.600	0.606	0.002	1.379	0.003	0.003	0.051	0.051	18.2	18.2314	556.6

Max Storage Req= 556.6 C.F.

SCS Type 1A Regional Storm - Central Basin
Stormwater Runoff Area - Right Ditch

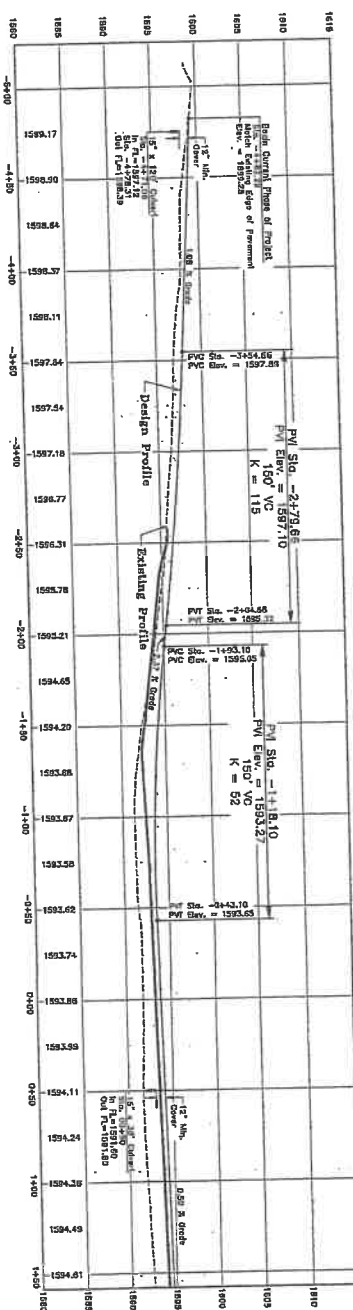
Area (acres) = 1.652 P (inches) = 1.5 d₁(min) = 8 T_c(min) = 5 Infiltration Area (ft²) = 7230.0
 W = 0.375 Max Storage (cu. ft.) = 480.2
 Pervious Area (acres) = 0.746 CN = 87 S = 1.49 0.2S = 0.30 Infiltration Rate (ft/min/ft²) = 0.0018
 Impervious Area (acres) = 1.106 CN = 98 S = 0.20 0.2S = 0.04 Total Disp = 78.084000

1	2.0	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Time	Time	Time	Reinfall	Incremental	Accum.	Pervious	Pervious	Impervious	Impervious	Total	Instant	Design Flow	Incremental	Drywell	Accum.
Increment	Hours	(min)	Distribution	Rainfall	Rainfall	Acc. Run	Inc. Run	Acc. Run	Inc. Run	Runoff	Flow	Rate	Flow	Disp. Volume	Storage
			(Fraction)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(inches)	(cfs)	(cfs)	(cf)	(cf)
1	0.0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
2	0.1	5	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
3	0.2	12	0.002	0.003	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
4	0.3	18	0.002	0.003	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
5	0.4	24	0.002	0.003	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
6	0.5	30	0.002	0.003	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
7	0.6	36	0.002	0.003	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
8	0.7	42	0.002	0.003	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
9	0.8	48	0.002	0.003	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
10	0.9	54	0.002	0.003	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
11	1.0	60	0.002	0.003	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
12	1.1	66	0.003	0.005	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0000	0.0
13	1.2	72	0.003	0.005	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0045	0.0
14	1.3	78	0.003	0.005	0.046	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.2	0.2250	0.0
15	1.4	84	0.003	0.005	0.051	0.000	0.000	0.001	0.000	0.000	0.004	0.002	0.8	0.8086	0.0
16	1.5	90	0.003	0.005	0.056	0.000	0.000	0.001	0.001	0.000	0.006	0.004	1.6	1.5613	0.0
17	1.6	96	0.003	0.005	0.061	0.000	0.000	0.002	0.001	0.000	0.008	0.006	2.3	2.3167	0.0
18	1.7	102	0.003	0.005	0.066	0.000	0.000	0.003	0.001	0.001	0.010	0.008	3.0	3.0368	0.0
19	1.8	108	0.003	0.005	0.070	0.000	0.000	0.004	0.001	0.001	0.012	0.010	3.7	3.7149	0.0
20	1.9	114	0.003	0.005	0.075	0.000	0.000	0.005	0.001	0.001	0.014	0.012	4.4	4.3822	0.0
21	2.0	120	0.003	0.005	0.080	0.000	0.000	0.006	0.001	0.001	0.015	0.014	5.0	4.9512	0.0
22	2.1	126	0.003	0.005	0.085	0.000	0.000	0.008	0.001	0.001	0.017	0.015	5.5	5.5149	0.0
23	2.2	132	0.003	0.005	0.090	0.000	0.000	0.009	0.002	0.001	0.018	0.017	6.0	6.0460	0.0
24	2.3	138	0.004	0.006	0.096	0.000	0.000	0.012	0.002	0.001	0.026	0.021	7.5	7.4539	0.0
25	2.4	144	0.003	0.005	0.101	0.000	0.000	0.014	0.002	0.001	0.021	0.023	8.2	8.2079	0.0
26	2.5	150	0.003	0.005	0.106	0.000	0.000	0.016	0.002	0.001	0.022	0.022	7.9	7.8666	0.0
27	2.6	156	0.003	0.005	0.110	0.000	0.000	0.018	0.002	0.001	0.023	0.022	8.1	8.0907	0.0
28	2.7	162	0.003	0.005	0.115	0.000	0.000	0.020	0.002	0.001	0.024	0.023	8.4	8.4357	0.0
29	2.8	168	0.004	0.006	0.122	0.000	0.000	0.023	0.003	0.002	0.034	0.028	10.0	9.9624	0.0
30	2.9	174	0.003	0.005	0.126	0.000	0.000	0.025	0.002	0.001	0.027	0.030	10.6	10.6460	0.0
31	3.0	180	0.003	0.005	0.131	0.000	0.000	0.028	0.002	0.001	0.027	0.028	9.9	9.9384	0.0
32	3.1	186	0.003	0.005	0.136	0.000	0.000	0.030	0.003	0.002	0.028	0.028	10.0	9.9937	0.0
33	3.2	192	0.003	0.005	0.141	0.000	0.000	0.033	0.003	0.002	0.030	0.029	10.2	10.2285	0.0
34	3.3	198	0.003	0.005	0.146	0.000	0.000	0.036	0.003	0.002	0.030	0.029	10.0	10.4979	0.0
35	3.4	204	0.004	0.006	0.152	0.000	0.000	0.039	0.004	0.002	0.041	0.034	12.2	12.1604	0.0
36	3.5	210	0.003	0.005	0.157	0.000	0.000	0.042	0.003	0.002	0.041	0.036	12.8	12.7980	0.0
37	3.6	216	0.003	0.005	0.162	0.000	0.000	0.045	0.003	0.002	0.042	0.033	11.8	11.7752	0.0
38	3.7	222	0.004	0.006	0.168	0.000	0.000	0.049	0.004	0.002	0.044	0.037	13.2	13.1821	0.0
39	3.8	228	0.004	0.006	0.174	0.000	0.000	0.053	0.004	0.002	0.045	0.042	15.2	15.2497	0.0
40	3.9	234	0.003	0.005	0.179	0.000	0.000	0.056	0.003	0.002	0.044	0.040	14.5	14.4840	0.0
41	4.0	240	0.004	0.006	0.186	0.000	0.000	0.060	0.004	0.002	0.046	0.040	14.5	14.5213	0.0
42	4.1	246	0.004	0.006	0.192	0.000	0.000	0.064	0.004	0.003	0.047	0.045	16.3	16.3043	0.0
43	4.2	252	0.003	0.005	0.197	0.000	0.000	0.068	0.003	0.002	0.046	0.043	15.3	15.3473	0.0
44	4.3	258	0.004	0.006	0.203	0.000	0.000	0.072	0.004	0.003	0.049	0.043	15.3	15.3046	0.0
45	4.4	264	0.004	0.006	0.210	0.000	0.000	0.076	0.004	0.003	0.050	0.048	17.1	17.1188	0.0
46	4.5	270	0.004	0.006	0.216	0.000	0.000	0.081	0.005	0.003	0.050	0.049	17.8	17.7759	0.0
47	4.6	276	0.004	0.006	0.222	0.000	0.000	0.085	0.005	0.003	0.051	0.050	18.1	18.1334	0.0
48	4.7	282	0.004	0.006	0.229	0.000	0.000	0.090	0.005	0.003	0.052	0.051	18.4	18.4066	0.0
49	4.8	288	0.004	0.006	0.235	0.000	0.000	0.095	0.005	0.003	0.052	0.052	18.6	18.6497	0.0
50	4.9	294	0.005	0.008	0.243	0.000	0.000	0.101	0.006	0.004	0.066	0.057	20.7	20.6762	0.0
51	5.0	300	0.004	0.006	0.250	0.000	0.000	0.106	0.005	0.003	0.054	0.059	21.4	21.3602	0.0
52	5.1	306	0.005	0.008	0.258	0.000	0.000	0.112	0.006	0.004	0.068	0.060	21.7	21.7415	0.0
53	5.2	312	0.004	0.006	0.264	0.000	0.000	0.117	0.005	0.003	0.055	0.061	22.0	21.9965	0.0
54	5.3	318	0.005	0.008	0.272	0.000	0.000	0.123	0.006	0.004	0.069	0.062	22.2	22.2499	0.0
55	5.4	324	0.005	0.008	0.280	0.000	0.000	0.129	0.006	0.004	0.070	0.068	24.4	24.3538	0.0
56	5.5	330	0.005	0.008	0.288	0.000	0.000	0.135	0.006	0.004	0.071	0.070	25.1	25.0593	0.0
57	5.6	336	0.005	0.008	0.296	0.000	0.000	0.142	0.006	0.004	0.071	0.071	25.4	25.4278	0.0
58	5.7	342	0.005	0.008	0.304	0.000	0.000	0.148	0.006	0.004	0.072	0.071	25.7	25.7056	0.0
59	5.8	348	0.005	0.008	0.312	0.000	0.000	0.155	0.006	0.004	0.073	0.072	26.0	26.0351	0.0
60	5.9	354	0.005	0.008	0.320	0.000	0.000	0.161	0.007	0.004	0.074	0.073	26.4	26.4363	0.0
61	6.0	360	0.006	0.010	0.330	0.001	0.000	0.169	0.008	0.005	0.091	0.080	28.9	28.9084	0.0
62	6.1	366	0.006	0.010	0.339	0.001	0.000	0.177	0.008	0.005	0.092	0.089	32.0	31.9531	0.0
63	6.2	372	0.006	0.010	0.349	0.002	0.001	0.185	0.008	0.005	0.094	0.092	33.1	33.1354	0.0
64	6.3	378	0.006	0.010	0.358	0.002	0.001	0.193	0.008	0.005	0.095	0.094	33.8	33.8374	0.0
65	6.4	384	0.007	0.011	0.370	0.003	0.001	0.203	0.010	0.006	0.113	0.102	36.6	36.6019	0.0
66	6.5	390	0.006	0.010	0.379	0.004	0.001	0.211	0.008	0.005	0.098	0.105	37.7	37.7029	0.0
67	6.6	396	0.006	0.010	0.389	0.005	0.001	0.219	0.008	0.005	0.100	0.100	36.2	36.1760	0.0
68	6.7	402	0.006	0.010	0.398	0.006	0.001	0.228	0.008	0.005	0.101	0.100	36.2	36.1501	0.0
69	6.8	408	0.006	0.010	0.408	0.007	0.001	0.236	0.008	0.005	0.102	0.101	36.5	36.4854	0.0
70	6.9	414	0.006	0.010	0.418	0.009	0.001	0.244	0.008	0.006	0.103	0.103	36.9	36.9011	0.0
71	7.0	420	0.007	0.011	0.429	0.010	0.002	0.254	0.010	0.007	0.122	0.110	39.7	39.6972	0.0
72	7.1	426	0.007	0.011	0.440	0.012	0.002	0.264	0.010	0.007	0.124	0.120	43.1	43.1335	0.0
73	7.2	432	0.008	0.013	0.453	0.014	0.002	0.276	0.011	0.008	0.143	0.130	46.8	46.8348	0.0
74	7.3	438	0.008	0.013	0.466	0.017	0.002	0.287	0.011	0.009	0.145	0.141	50.6		

85	8.4	504	0.010	0.016	0.755	0.107	0.007	0.556	0.015	0.012	0.219	0.230	82.8	76.0840	480.2
86	8.5	510	0.008	0.013	0.768	0.112	0.005	0.568	0.012	0.009	0.176	0.205	74.0	73.9530	480.2
87	8.6	516	0.009	0.014	0.782	0.118	0.006	0.582	0.014	0.011	0.199	0.192	69.1	69.1106	480.2
88	8.7	522	0.009	0.014	0.797	0.124	0.006	0.595	0.014	0.011	0.200	0.198	71.2	71.1691	480.2
89	8.8	528	0.007	0.011	0.808	0.129	0.005	0.606	0.011	0.008	0.156	0.183	65.9	65.9339	480.2
90	8.9	534	0.008	0.013	0.821	0.135	0.006	0.618	0.012	0.010	0.180	0.172	61.8	61.8476	480.2
91	9.0	540	0.007	0.011	0.832	0.140	0.005	0.629	0.011	0.008	0.158	0.169	61.0	61.0123	480.2
92	9.1	546	0.007	0.011	0.843	0.145	0.005	0.640	0.011	0.008	0.158	0.161	57.9	57.9493	480.2
93	9.2	552	0.006	0.010	0.853	0.150	0.004	0.649	0.009	0.007	0.136	0.151	54.3	54.2778	480.2
94	9.3	558	0.006	0.010	0.862	0.154	0.005	0.658	0.009	0.007	0.137	0.140	50.4	50.4256	480.2
95	9.4	564	0.006	0.010	0.872	0.159	0.005	0.667	0.009	0.007	0.137	0.139	49.6	49.5859	480.2
96	9.5	570	0.005	0.008	0.880	0.163	0.004	0.675	0.008	0.006	0.115	0.129	46.4	46.3914	480.2
97	9.6	576	0.006	0.010	0.890	0.167	0.005	0.684	0.009	0.007	0.138	0.127	45.7	45.6978	480.2
98	9.7	582	0.005	0.008	0.898	0.171	0.004	0.692	0.008	0.005	0.115	0.127	45.6	45.6107	480.2
99	9.8	588	0.006	0.010	0.907	0.176	0.005	0.701	0.009	0.007	0.139	0.127	45.7	45.6909	480.2
100	9.9	594	0.005	0.008	0.915	0.180	0.004	0.709	0.008	0.005	0.116	0.127	45.8	45.7947	480.2
101	10.0	600	0.005	0.008	0.923	0.184	0.004	0.717	0.008	0.005	0.116	0.119	42.8	42.7786	480.2
102	10.1	606	0.005	0.008	0.931	0.189	0.004	0.724	0.008	0.006	0.116	0.117	42.1	42.0986	480.2
103	10.2	612	0.005	0.008	0.939	0.192	0.004	0.732	0.008	0.006	0.117	0.117	42.0	42.0017	480.2
104	10.3	618	0.005	0.008	0.947	0.196	0.004	0.740	0.008	0.006	0.117	0.117	42.0	42.0486	480.2
105	10.4	624	0.004	0.006	0.954	0.199	0.003	0.746	0.006	0.005	0.094	0.108	39.0	38.9644	480.2
106	10.5	630	0.005	0.008	0.962	0.204	0.004	0.754	0.008	0.006	0.117	0.106	38.3	38.2564	480.2
107	10.6	636	0.005	0.008	0.970	0.208	0.004	0.761	0.008	0.006	0.118	0.115	41.3	41.3103	480.2
108	10.7	642	0.004	0.006	0.976	0.211	0.003	0.768	0.006	0.005	0.094	0.108	39.0	38.9549	480.2
109	10.8	648	0.005	0.008	0.984	0.215	0.004	0.775	0.008	0.006	0.118	0.107	38.4	38.4271	480.2
110	10.9	654	0.005	0.008	0.992	0.220	0.004	0.783	0.008	0.006	0.118	0.115	41.5	41.5431	480.2
111	11.0	660	0.004	0.006	0.998	0.223	0.003	0.789	0.006	0.005	0.095	0.109	39.2	39.1822	480.2
112	11.1	666	0.004	0.006	1.005	0.227	0.003	0.796	0.006	0.005	0.095	0.098	35.4	35.4397	480.2
113	11.2	672	0.005	0.008	1.013	0.231	0.004	0.803	0.008	0.006	0.119	0.105	37.8	37.7620	480.2
114	11.3	678	0.004	0.006	1.019	0.234	0.003	0.810	0.006	0.005	0.095	0.107	38.4	38.3888	480.2
115	11.4	684	0.004	0.006	1.026	0.238	0.003	0.816	0.006	0.005	0.096	0.098	35.4	35.3748	480.2
116	11.5	690	0.004	0.006	1.032	0.241	0.004	0.822	0.006	0.005	0.096	0.096	34.7	34.6615	480.2
117	11.6	696	0.004	0.006	1.038	0.245	0.004	0.828	0.006	0.005	0.096	0.096	34.5	34.5230	480.2
118	11.7	702	0.004	0.006	1.045	0.248	0.004	0.834	0.006	0.005	0.096	0.096	34.5	34.5278	480.2
119	11.8	708	0.004	0.006	1.051	0.252	0.004	0.841	0.006	0.005	0.096	0.096	34.6	34.5681	480.2
120	11.9	714	0.003	0.005	1.056	0.255	0.003	0.845	0.005	0.004	0.072	0.087	31.4	31.3658	480.2
121	12.0	720	0.004	0.006	1.062	0.258	0.004	0.851	0.006	0.005	0.096	0.085	30.6	30.5988	480.2
122	12.1	726	0.004	0.006	1.069	0.262	0.004	0.858	0.006	0.005	0.097	0.094	33.7	33.6913	480.2
123	12.2	732	0.003	0.005	1.074	0.265	0.003	0.862	0.005	0.004	0.072	0.087	31.2	31.2381	480.2
124	12.3	738	0.004	0.006	1.080	0.268	0.004	0.869	0.006	0.005	0.097	0.085	30.7	30.6575	480.2
125	12.4	744	0.004	0.006	1.086	0.272	0.004	0.875	0.006	0.005	0.097	0.094	33.8	33.8088	480.2
126	12.5	750	0.004	0.006	1.093	0.275	0.004	0.881	0.006	0.005	0.097	0.096	34.6	34.6333	480.2
127	12.6	756	0.004	0.006	1.099	0.279	0.004	0.887	0.006	0.005	0.097	0.097	34.9	34.8758	480.2
128	12.7	762	0.003	0.005	1.104	0.282	0.003	0.892	0.005	0.004	0.073	0.088	31.7	31.6868	480.2
129	12.8	768	0.004	0.006	1.110	0.286	0.004	0.898	0.006	0.005	0.097	0.086	30.9	30.9208	480.2
130	12.9	774	0.003	0.005	1.115	0.288	0.003	0.903	0.005	0.004	0.073	0.085	30.8	30.7526	480.2
131	13.0	780	0.004	0.006	1.122	0.292	0.004	0.909	0.006	0.005	0.098	0.085	30.7	30.7413	480.2
132	13.1	786	0.004	0.006	1.128	0.296	0.004	0.915	0.006	0.005	0.098	0.085	34.1	34.0623	480.2
133	13.2	792	0.003	0.005	1.133	0.299	0.003	0.920	0.005	0.004	0.073	0.088	31.6	31.6219	480.2
134	13.3	798	0.004	0.006	1.139	0.302	0.004	0.926	0.006	0.005	0.098	0.086	31.0	31.0418	480.2
135	13.4	804	0.004	0.006	1.146	0.306	0.004	0.933	0.006	0.005	0.098	0.085	34.2	34.2316	480.2
136	13.5	810	0.003	0.005	1.150	0.309	0.003	0.937	0.005	0.004	0.074	0.088	31.7	31.7460	480.2
137	13.6	816	0.003	0.005	1.155	0.312	0.003	0.942	0.005	0.004	0.074	0.077	27.8	27.8340	480.2
138	13.7	822	0.004	0.006	1.162	0.316	0.004	0.948	0.006	0.005	0.098	0.084	30.2	30.1976	480.2
139	13.8	828	0.003	0.005	1.166	0.319	0.003	0.953	0.005	0.004	0.074	0.086	30.8	30.8101	480.2
140	13.9	834	0.004	0.006	1.173	0.323	0.004	0.959	0.006	0.005	0.099	0.086	31.0	30.9919	480.2
141	14.0	840	0.003	0.005	1.178	0.325	0.003	0.964	0.005	0.004	0.074	0.086	31.1	31.0586	480.2
142	14.1	846	0.003	0.005	1.182	0.328	0.003	0.968	0.005	0.004	0.074	0.077	27.8	27.7663	480.2
143	14.2	852	0.004	0.006	1.189	0.332	0.004	0.975	0.006	0.005	0.099	0.084	30.3	30.3013	480.2
144	14.3	858	0.003	0.005	1.194	0.335	0.003	0.979	0.005	0.004	0.074	0.086	31.0	30.9558	480.2
145	14.4	864	0.003	0.005	1.198	0.338	0.003	0.984	0.005	0.004	0.074	0.077	27.8	27.8001	480.2
146	14.5	870	0.004	0.006	1.205	0.342	0.004	0.990	0.006	0.005	0.099	0.084	30.4	30.3786	480.2
147	14.6	876	0.003	0.005	1.210	0.345	0.003	0.995	0.005	0.004	0.074	0.084	31.0	31.0435	480.2
148	14.7	882	0.003	0.005	1.214	0.348	0.003	1.000	0.005	0.004	0.075	0.077	27.9	27.8801	480.2
149	14.8	888	0.004	0.006	1.221	0.352	0.004	1.006	0.006	0.005	0.099	0.085	30.5	30.4659	480.2
150	14.9	894	0.003	0.005	1.226	0.355	0.003	1.011	0.005	0.004	0.075	0.086	31.1	31.1322	480.2
151	15.0	900	0.003	0.005	1.230	0.358	0.003	1.015	0.005	0.004	0.075	0.078	28.0	27.9582	480.2
152	15.1	906	0.003	0.005	1.235	0.361	0.003	1.020	0.005	0.004	0.075	0.076	27.2	27.1828	480.2
153	15.2	912	0.004	0.006	1.242	0.365	0.004	1.026	0.006	0.005	0.100	0.084	30.4	30.3769	480.2
154	15.3	918	0.003	0.005	1.246	0.368	0.003	1.031	0.005	0.004	0.075	0.087	31.2	31.1948	480.2
155	15.4	924	0.003	0.005	1.251	0.371	0.003	1.036	0.005	0.004	0.075	0.078	28.0	28.0470	480.2
156	15.5	930	0.003	0.005	1.256	0.374	0.003	1.040	0.005	0.004	0.075	0.076	27.3	27.2764	480.2
157	15.6	936	0.003	0.005	1.261	0.377	0.003	1.045	0.005	0.004	0.075	0.075	27.1	27.1000	480.2
158	15.7	942	0.004	0.006	1.267	0.381	0.004	1.051	0.006	0.005	0.100	0.085	30.5	30.4580	480.2
159	15.8	948	0.003	0.005	1.272	0.384	0.003	1.056	0.005	0.004	0.075	0.087	31.3	31.3163	480.2
160	15.9	954	0.003	0.005	1.277	0.387	0.003	1.061	0.005	0.004	0.075	0.078	28.2	28.1834	480.2
161	16.0	960	0.003	0.005	1.282	0.390	0.003	1.066	0.005	0.004	0.075	0.076	27.4	2	

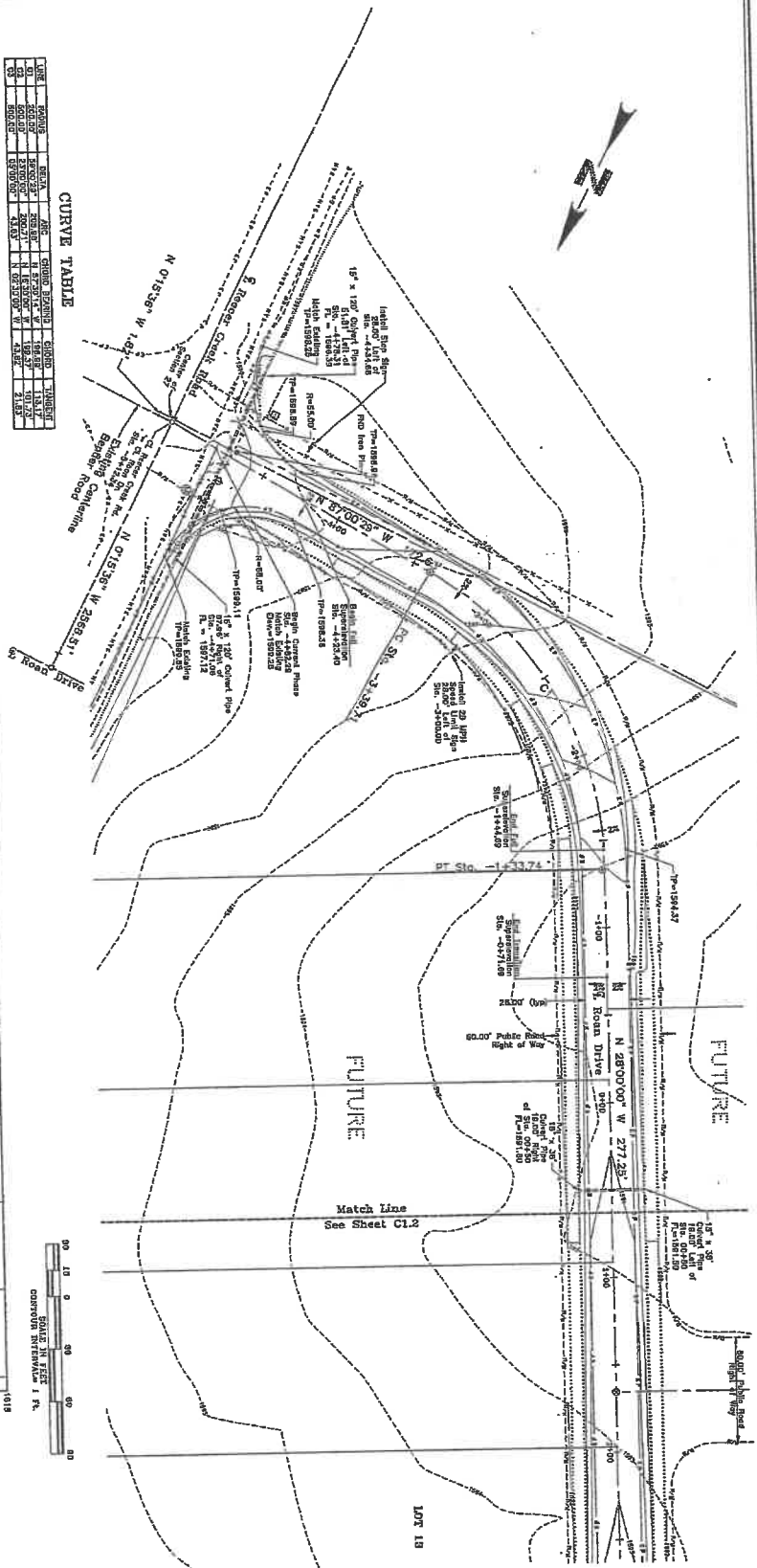
183	18.2	1092	0.002	0.003	1.384	0.457	0.002	1.166	0.003	0.003	0.051	0.067	24.1	24.0898	480.2
184	18.3	1098	0.003	0.005	1.389	0.460	0.003	1.171	0.005	0.004	0.077	0.065	23.3	23.2568	480.2
185	18.4	1104	0.003	0.005	1.394	0.463	0.003	1.175	0.005	0.004	0.077	0.074	26.5	26.5068	480.2
186	18.5	1110	0.003	0.005	1.398	0.466	0.003	1.180	0.005	0.004	0.077	0.076	27.3	27.3329	480.2
187	18.6	1116	0.002	0.003	1.402	0.468	0.002	1.183	0.003	0.003	0.051	0.067	24.1	24.0978	480.2
188	18.7	1122	0.003	0.005	1.406	0.471	0.003	1.188	0.005	0.004	0.077	0.065	23.3	23.3002	480.2
189	18.8	1128	0.003	0.005	1.411	0.475	0.003	1.193	0.005	0.004	0.077	0.074	26.5	26.5672	480.2
190	18.9	1134	0.002	0.003	1.414	0.477	0.002	1.196	0.003	0.003	0.051	0.066	23.9	23.9361	480.2
191	19.0	1140	0.003	0.005	1.419	0.480	0.003	1.201	0.005	0.004	0.077	0.065	23.3	23.2894	480.2
192	19.1	1146	0.003	0.005	1.424	0.483	0.003	1.205	0.005	0.004	0.077	0.074	26.6	26.5998	480.2
193	19.2	1152	0.002	0.003	1.427	0.485	0.002	1.208	0.003	0.003	0.051	0.067	24.0	23.9736	480.2
194	19.3	1158	0.003	0.005	1.432	0.489	0.003	1.213	0.005	0.004	0.077	0.065	23.3	23.3279	480.2
195	19.4	1164	0.002	0.003	1.435	0.491	0.002	1.216	0.003	0.003	0.051	0.064	23.2	23.1737	480.2
196	19.5	1170	0.003	0.005	1.440	0.494	0.003	1.221	0.005	0.004	0.077	0.064	23.1	23.1459	480.2
197	19.6	1176	0.003	0.005	1.445	0.497	0.003	1.226	0.005	0.004	0.077	0.074	26.6	26.6202	480.2
198	19.7	1182	0.002	0.003	1.448	0.500	0.002	1.229	0.003	0.003	0.051	0.067	24.0	24.0254	480.2
199	19.8	1188	0.003	0.005	1.453	0.503	0.003	1.234	0.005	0.004	0.077	0.065	23.4	23.3873	480.2
200	19.9	1194	0.002	0.003	1.456	0.505	0.002	1.237	0.003	0.003	0.052	0.065	23.2	23.2348	480.2
201	20.0	1200	0.003	0.005	1.461	0.508	0.003	1.242	0.005	0.004	0.077	0.064	23.2	23.2071	480.2
202	20.1	1206	0.002	0.003	1.464	0.510	0.002	1.245	0.003	0.003	0.052	0.064	23.2	23.2072	480.2
203	20.2	1212	0.003	0.005	1.469	0.514	0.003	1.249	0.005	0.004	0.077	0.064	23.2	23.2176	480.2
204	20.3	1218	0.002	0.003	1.472	0.516	0.002	1.253	0.003	0.003	0.052	0.065	23.2	23.2271	480.2
205	20.4	1224	0.002	0.003	1.475	0.518	0.002	1.256	0.003	0.003	0.052	0.055	19.8	19.7518	480.2
206	20.5	1230	0.003	0.005	1.480	0.521	0.003	1.260	0.005	0.004	0.078	0.062	22.4	22.3778	480.2
207	20.6	1236	0.002	0.003	1.483	0.524	0.002	1.264	0.003	0.003	0.052	0.064	23.0	23.0411	480.2
208	20.7	1242	0.003	0.005	1.488	0.527	0.003	1.268	0.005	0.004	0.078	0.064	23.2	23.2171	480.2
209	20.8	1248	0.002	0.003	1.491	0.529	0.002	1.271	0.003	0.003	0.052	0.065	23.3	23.2678	480.2
210	20.9	1254	0.002	0.003	1.494	0.531	0.002	1.275	0.003	0.003	0.052	0.055	19.8	19.7945	480.2
211	21.0	1260	0.003	0.005	1.499	0.535	0.003	1.279	0.005	0.004	0.078	0.062	22.4	22.4289	480.2
212	21.1	1266	0.002	0.003	1.502	0.537	0.002	1.283	0.003	0.003	0.052	0.064	23.1	23.0941	480.2
213	21.2	1272	0.002	0.003	1.506	0.539	0.002	1.286	0.003	0.003	0.052	0.055	19.8	19.7697	480.2
214	21.3	1278	0.003	0.005	1.510	0.542	0.003	1.290	0.005	0.004	0.078	0.062	22.4	22.4459	480.2
215	21.4	1284	0.002	0.003	1.514	0.545	0.002	1.294	0.003	0.003	0.052	0.064	23.1	23.1215	480.2
216	21.5	1290	0.002	0.003	1.517	0.547	0.002	1.297	0.003	0.003	0.052	0.055	19.8	19.7949	480.2
217	21.6	1296	0.003	0.005	1.522	0.550	0.003	1.301	0.005	0.004	0.078	0.062	22.5	22.4750	480.2
218	21.7	1302	0.002	0.003	1.525	0.553	0.002	1.305	0.003	0.003	0.052	0.064	23.2	23.1515	480.2
219	21.8	1308	0.002	0.003	1.528	0.555	0.002	1.308	0.003	0.003	0.052	0.055	19.8	19.8205	480.2
220	21.9	1314	0.002	0.003	1.531	0.557	0.002	1.311	0.003	0.003	0.052	0.053	19.0	18.9930	480.2
221	22.0	1320	0.002	0.003	1.534	0.559	0.002	1.314	0.003	0.003	0.052	0.052	18.6	18.7912	480.2
222	22.1	1326	0.003	0.005	1.539	0.563	0.003	1.319	0.005	0.004	0.078	0.062	22.3	22.2594	480.2
223	22.2	1332	0.002	0.003	1.542	0.565	0.002	1.322	0.003	0.003	0.052	0.064	23.1	23.1328	480.2
224	22.3	1338	0.002	0.003	1.546	0.567	0.002	1.325	0.003	0.003	0.052	0.056	18.8	18.8439	480.2
225	22.4	1344	0.002	0.003	1.549	0.569	0.002	1.328	0.003	0.003	0.052	0.053	19.0	19.0267	480.2
226	22.5	1350	0.002	0.003	1.552	0.572	0.002	1.331	0.003	0.003	0.052	0.052	18.8	18.8274	480.2
227	22.6	1356	0.002	0.003	1.555	0.574	0.002	1.335	0.003	0.003	0.052	0.052	18.8	18.7826	480.2
228	22.7	1362	0.002	0.003	1.558	0.576	0.002	1.338	0.003	0.003	0.052	0.052	18.8	18.7764	480.2
229	22.8	1368	0.002	0.003	1.562	0.578	0.002	1.341	0.003	0.003	0.052	0.052	18.8	18.7798	480.2
230	22.9	1374	0.002	0.003	1.565	0.581	0.002	1.344	0.003	0.003	0.052	0.052	18.8	18.7856	480.2
231	23.0	1380	0.002	0.003	1.568	0.583	0.002	1.347	0.003	0.003	0.052	0.052	18.8	18.7919	480.2
232	23.1	1386	0.002	0.003	1.571	0.585	0.002	1.350	0.003	0.003	0.052	0.052	18.8	18.7984	480.2
233	23.2	1392	0.002	0.003	1.574	0.587	0.002	1.353	0.003	0.003	0.052	0.052	18.8	18.8050	480.2
234	23.3	1398	0.002	0.003	1.578	0.590	0.002	1.357	0.003	0.003	0.052	0.052	18.8	18.8114	480.2
235	23.4	1404	0.002	0.003	1.581	0.592	0.002	1.360	0.003	0.003	0.052	0.052	18.8	18.8179	480.2
236	23.5	1410	0.002	0.003	1.584	0.594	0.002	1.363	0.003	0.003	0.052	0.052	18.8	18.8244	480.2
237	23.6	1416	0.002	0.003	1.587	0.597	0.002	1.366	0.003	0.003	0.052	0.052	18.8	18.8308	480.2
238	23.7	1422	0.002	0.003	1.590	0.599	0.002	1.369	0.003	0.003	0.052	0.052	18.8	18.8372	480.2
239	23.8	1428	0.002	0.003	1.594	0.601	0.002	1.372	0.003	0.003	0.052	0.052	18.8	18.8436	480.2
240	23.9	1434	0.002	0.003	1.597	0.603	0.002	1.376	0.003	0.003	0.052	0.052	18.8	18.8499	480.2
241	24.0	1440	0.002	0.003	1.600	0.606	0.002	1.379	0.003	0.003	0.052	0.052	18.9	18.8563	480.2

Max Storage Req= 480.2 C.F.



CURVE TABLE

STATION	PC	PT	PI	Curve Length	Grade	Vertical Curve
1800.00	1800.00	1800.00	1800.00	100.00	-0.50	
1800.00	1800.00	1800.00	1800.00	150.00	-0.50	
1800.00	1800.00	1800.00	1800.00	100.00	-0.50	



10/15/18

SHEET NO.
C1.1
181827

LCU, INC.
PALOMINO MAJOR PLAT, PHASE 3
ROAN DRIVE IMPROVEMENTS
Plan and Profile Sta. -5+00 to Sta. 2+00
Washington

No.	Revisions	Date	By

WESTERN PACIFIC
ENGINEERING & SURVEY
A TERRA DEVELOPMENT SERVICES CORPORATION
1320 E. Houston Place, Moscow, Idaho, Washington
509-253-1122 • 509-253-1123
Serving the Northwest and More



