WASHINGTON
UTC
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

	)	DOCKET NO. TR-
	)	
Washington State Dept. of Transportation	)	PETITION TO CONSTRUCT OR
	)	RECONSTRUCT A HIGHWAY-RAIL
Petitioner,	)	GRADE CROSSING AND INSTALL
	)	AN INTER-TIE BETWEEN A
vs.	)	HIGHWAY SIGNAL AND A
Snohomish County Parks & Recreation	)	RAILROAD CROSSING SIGNAL
	)	SYSTEM
Respondent	)	
	)	
	)	USDOT CROSSING NO.: 091814T

Prior to submitting a Petition to **Construct** a highway-rail grade crossing and install an inter-tie between a Highway Signal and a Railroad Crossing Signal System to the Washington Utilities and Transportation Commission (UTC), State Environmental Protection Act (SEPA) requirements must be met. Washington Administrative Code (WAC) 197-11-865 (2) requires:

> **All actions of the utilities and transportation commission under statutes administered as of December 12, 1975, are exempted, except the following:**
>
> **(2) Authorization of the openings or closing of any highway/railroad grade crossing, or the direction of physical connection of the line of one railroad with that of another;**

Please attach sufficient documentation to demonstrate that the SEPA requirement has been fulfilled. For additional information on SEPA requirements contact the Department of Ecology.

The Petitioner asks the Washington Utilities and Transportation Commission to approve construction or reconstruction of a highway-rail grade crossing and inter-tie the highway signal with the railroad crossing signal system.

☐ **Construction** ☒ **Reconstruction**

Section 1 – Petitioner's Information

Washington State Department of Transportation
Petitioner

Signature

310 Maple Park Avenue SE, Suite 2B, Olympia, WA 98504
Street Address City, State and Zip Code

PO Box 47329 Olympia, WA 98504-7329
Mailing Address, if different than the street address

Connie Raezer **360-705-7459** **raezerc@wsdot.wa.gov**
Contact Person Name Contact Phone Number and E-mail Address

Section 2 – Respondent's Information

Snohomish County Parks & Recreation
Respondent

6705 Puget Park Drive, Snohomish WA 98296
Street Address, City, State and Zip Code

Mailing Address, if different than the street address

Contact Person Name Contact Phone Number and E-mail Address

Ballard Terminal Railroad Co., LLC
Respondent

4725 Ballard Ave NW, Seattle, WA 98107
Street Address City, State and Zip Code

Mailing Address, if different than the street address

James Forgette **206-799-1245 / jr.forgette@bdtlrr.com**
Contact Person Name Contact Phone Number and E-mail Address

Section 5 – Temporary Crossing

1. Is the crossing proposed to be temporary? Yes ____ No __X__

2. If so, describe the purpose of the crossing and the estimated time it will be needed

3. Will the petitioner remove the crossing at completion of the activity requiring the temporary crossing? Yes ____ No ____

Approximate date of removal _____

Section 6 – Current Highway Traffic Information

1. Name of roadway/highway **State Route 526 (Maltby Rd)**

2. Roadway classification **Urban Minor Arterial**

3. Road authority **Washington State Department of Transportation (WSDOT)**

4. Average annual daily traffic (AADT) **7,800 vehicles (2017 count)**

5. Number of lanes **2 lanes**

6. Roadway speed **35 mph**

7. Is the crossing part of an established truck route? Yes **X** No _____

8. If so, trucks are what percent of total daily traffic? **12%**

9. Is the crossing part of an established school bus route? Yes **X** No _____

10. If so, how many school buses travel over the crossing each day? **6**

11. Describe any changes to the information in 1 through 7, above, expected within ten years:

Section 3 – Proposed or Existing Crossing Location

1. Existing highway/roadway **SR 524 (aka Maltby Rd)**

2. Existing railroad **Eastside Rail Corridor – Woodinville Subdivision/Snohomish County**

3. Location of proposed crossing: Located in **Sec 24,T27N, R5E W.M.**

4. GPS location, if known **47.805, -122.11205**

5. Railroad mile post (nearest tenth) **30.04**

6. City **Near Maltby** County **Snohomish**

Section 4 – Proposed or Existing Crossing Information

1. Railroad company **Ballard Terminal Railroad Co., LLC**

2. Type of railroad at crossing ☒ Common Carrier ☐ Logging ☐ Industrial

☐ Passenger ☐ Excursion

3. Type of tracks at crossing ☒ Main Line ☒ Siding or Spur

4. Number of tracks at crossing **2 tracks**

5. Average daily train traffic, freight **1**

Authorized freight train speed **< 10 mph** Operated freight train speed **< 10 mph**

6. Average daily train traffic, passenger **N/A**

Authorized passenger train speed **N/A** Operated passenger train speed **N/A**

7. Will the proposed crossing eliminate the need for one or more existing crossings?
Yes ____ No **X**

8. If so, state the distance and direction from the proposed crossing.

9. Does the petitioner propose to close any existing crossings? Yes___ No **X**

Section 8 – Sight Distance

1. Complete the following table, describing the sight distance for motorists when approaching the tracks from either direction.
See attached site distance exhibits
a. Approaching the crossing from __WEST__, the current approach provides an unobstructed view as follows: (North, South, East, West)

Direction of sight (left or right)	**Number of feet from proposed crossing**	**Provides an unobstructed view for how many feet** (see attached exhibit)
Right	300	19
Right	200	28
Right	100	70
Right	50	102
Right	25	189
Left	300	40
Left	200	43
Left	100	50
Left	50	68
Left	25	128

b. Approaching the crossing from __South__, the current approach provides an unobstructed view as follows: (Opposite direction-North, South, East, West)

Direction of sight (left or right)	**Number of feet from proposed crossing**	**Provides an unobstructed view for how many feet** (see attached exhibit)
Right	300	772
Right	200	772
Right	100	772
Right	50	772
Right	25	772
Left	300	745
Left	200	660
Left	100	617
Left	50	575
Left	25	557

2. Will the new crossing provide a level approach measuring 25 feet from the center of the railway on both approaches to the crossing? Yes No **X**

3. If not, state in feet the length of level grade from the center of the railway on both approaches to the crossing. **East approach 4.6% grade (Existing grade, no change to roadway or crossing surface) West approach level (Existing grade)**

4. Will the new crossing provide an approach grade of not more than five percent prior to the level grade? **Yes existing grade is 4.6%** No

5. If not, state the percentage of grade prior to the level grade and explain why the grade exceeds

Section 7 – Alternatives to the Proposal

1. Does a safer location for a crossing exist within a reasonable distance of the proposed location?
   Yes ____ No **X**

2. If a safer location exists, explain why the crossing should not be located at that site.

3. Are there any hillsides, embankments, buildings, trees, railroad loading platforms or other barriers in the vicinity which may obstruct a motorist's view of the crossing?
   Yes ____ No **X**

4. If a barrier exists, describe:
   - ♦ Whether petitioner can relocate the crossing to avoid the obstruction and if not, why not.
   - ♦ How the barrier can be removed.
   - ♦ How the petitioner or another party can mitigate the hazard caused by the barrier.

5. Is it feasible to construct an over-crossing or under-crossing at the proposed location as an alternative to an at-grade crossing?
   Yes ____ No **X**

6. If an over-crossing or under-crossing is not feasible, explain why.
   An overcrossing is in the very conceptual stage and is not planned for a minimum of 10-15 years

7. Does the railway line, at any point in the vicinity of the proposed crossing, pass over a fill area or trestle or through a cut where it is feasible to construct an over-crossing or an under-crossing, even though it may be necessary to relocate a portion of the roadway to reach that point?
   Yes ____ No **X**

8. If such a location exists, state:
   - ♦ The distance and direction from the proposed crossing.
   - ♦ The approximate cost of construction.
   - ♦ Any reasons that exist to prevent locating the crossing at this site.

9. Is there an existing public or private crossing in the vicinity of the proposed crossing?
   Yes **X** No ____

10. If a crossing exists, state:
    - ♦ The distance and direction from the proposed crossing. – **1500' north**
    - ♦ Whether it is feasible to divert traffic from the proposed to the existing crossing. **No, intersection at Broadway (crossing 091815A) is a skewed crossing with an unprotected entrance onto Yew Way.**

five percent.

Section 9 – Illustration of Proposed Crossing Configuration

Attach a detailed diagram, drawing, map or other illustration showing the following:

- ♦ The vicinity of the proposed crossing.
- ♦ Layout of the railway and highway 500 feet adjacent to the crossing in all directions.
- ♦ Percent of grade.
- ♦ Obstructions of view as described in Section 7 or identified in Section 8.
- ♦ Traffic control layout showing the location of the existing and proposed signage.

See attached 90% SR524/ Maltby Road Railroad Crossing Signal Plans

Section 10 – Sidewalks

1. Provide the following information:
   a. Provide a description of the type of sidewalks proposed. **None Proposed**
   b. Describe who will maintain the sidewalks.
   c. Attach a proposed diagram or design of the crossing including the sidewalks.

Section 11 – Proposed Warning Signals or Devices

1. Explain in detail the number and type of automatic signals or other warning devices planned at the proposed crossing, including a cost estimate for each. If requesting pre-emption include the type of train detection circuitry, sequencing and advanced preemption time, justification for the changes and its effects on current warning devices and warning times for drivers.
See attached 60% SR524/ Maltby Road Railroad Crossing Signal Plans

2. Provide an estimate for maintaining the signals for 12 months. ~~**$10,000 yrly assuming 4 hours/month and 4 trouble calls**~~

3. Is the petitioner prepared to pay to the respondent railroad company its share of installing the warning devices as provided by law?
   Yes **X** No ____

Section 12 – Traffic Signal Preemption

Complete the attached Guide for Determining Time Requirements for Traffic Signal Preemption at Highway-Rail Grade Crossings.
1. Specify simultaneous or advance preemption requested.

APPROACH AND WARNING TIME CALCULATION	SIDING
MINIMUM WARNING TIME	25 SEC
PLUS CLEARANCE TIME	0 SEC
PLUS ADDITIONAL GATE DELAY	0 SEC
ERT	5 SEC
TOTAL WARNING TIME	30 SEC
TOTAL WARNING TIME	30 SEC
PED CLEAROUT	0 SEC
PLUS ADVANCE PREEMPT	30 SEC
TOTAL APPROACH TIME	60 SEC
MAXIMUM TRAIN SPEED	10 MPH
TIMES RATIO OF FT/SEC TO MPH	1.4667
TOTAL APPROACH DISTANCE	880 FT

APPROACH AND WARNING TIME CALCULATION	MAIN
MINIMUM WARNING TIME	25 SEC
PLUS CLEARANCE TIME	0 SEC
PLUS ADDITIONAL GATE DELAY	0 SEC
ERT	5 SEC
TOTAL WARNING TIME	30 SEC
TOTAL WARNING TIME	30 SEC
PED CLEAROUT	0 SEC
PLUS ADVANCE PREEMPT	30 SEC
TOTAL APPROACH TIME	60 SEC
MAXIMUM TRAIN SPEED	25 MPH
TIMES RATIO OF FT/SEC TO MPH	1.4667
TOTAL APPROACH DISTANCE	2238 FT

Total approach time 60 seconds is 20 seconds longer than that requested by RR and WSDOT
If advance preemption, what is the preemption time.

Section 13 – Additional Information

Provide any additional information supporting the proposal, including information such as the public benefits that would be derived from constructing a new crossing as proposed or modifying an existing crossing. Provide project specific information.

Section 14 – Waiver of Hearing by Respondent

Waiver of Hearing

The undersigned represents the Respondent in the petition to construct or reconstruct a highway-railroad grade crossing and inter-tie the highway signal with the railroad crossing signal system.

USDOT Crossing No.: 091814T

We have investigated the conditions at the proposed or existing crossing site. We are satisfied the conditions are the same as described by the Petitioner in this docket. We agree that a crossing be installed or reconstructed and the highway signals inter-tied with the railroad crossing signal system and consent to a decision by the commission without a hearing.

Dated at Snohomish, Washington, on the 2nd day of December, ~~2017~~ 2019 IT

Tom Teigen

Printed name of Respondent

Tom Teigen

Signature of Respondent's Representative

Director,

Title

Snohomish County Department of Parks, Recreation, & Tourism

Name of Company

425-388-6612, Tom.Teigen@snoco.org

Phone number and e-mail address

6705 Pilchuck Drive

Snohomish, WA 98296

Mailing address

Section 14 – Waiver of Hearing by Respondent

Waiver of Hearing

The undersigned represents the Respondent in the petition to construct or reconstruct a highway-railroad grade crossing and inter-tie the highway signal with the railroad crossing signal system.

USDOT Crossing No.: 091814T

We have investigated the conditions at the proposed or existing crossing site. We are satisfied the conditions are the same as described by the Petitioner in this docket. We agree that a crossing be installed or reconstructed and the highway signals inter-tied with the railroad crossing signal system and consent to a decision by the commission without a hearing.

Dated at Seattle, Washington, on the 21st day of February, 2020

James Forgette

Printed name of Respondent

James Forgette

Signature of Respondent's Representative

General Manager

Title

Ballard Terminal Railroad Co. LLC

Name of Company

206-799-1245 jr.forgette@bdtlrr.com

Phone number and e-mail address

4725 Ballard Ave NW Seattle, WA 98107

Mailing address

Section 13 – Additional Information

Provide any additional information supporting the proposal, including information such as the public benefits that would be derived from constructing a new crossing as proposed or modifying an existing crossing. Provide project specific information.

Snohomish County

Public Works
Transportation & Environmental Services

MEMORANDUM

Date: November 7, 2019
To: Eric Nordstrom, P.E.
From: Mary Auld, Senior Planner
Subject: SEPA Review

Project Name or Non-Project Action: SR525/Maltby Road Railroad Crossing Signal
Project Number: RR6273
Project Proponent: Eric Nordstrom/Public Works/Administration
Project Description: The proposed project is to construct railroad crossing signal flashers, a signal house bungalow and conduit within Snohomish County Parks owned railroad right-of-way. The project will provide a signal interconnection point for WSDOT's concurrent intersection improvement project at SR524 and Yew Way. The signal house would be located on the north side of the intersection.

This memo documents Public Works' SEPA review and analysis conducted on the above proposed project. Based on a review of the proposed project plans or non-project action dated 11/28/17, archaeological screening results (dated April 15, 2019), environmental/regulatory/interested party information, and site visit conducted by ENVS staff Beth Larsen and Erin Harker, ENVS has determined that the proposal is categorically exempt from SEPA under WAC 197-11-800(2) *Other minor new construction*:

(2) Other minor new construction:
(d) The construction or installation of minor road and street improvements by any agency or private party that include the following: i) Safety structures and equipment: Such as pavement marking, adding or removing turn restrictions, speed limit designation, physical measures to reduce motor vehicle traffic speed or volume, freeway surveillance and control systems, railroad protective devices (not including grade-separated crossings), grooving, glare screen, safety barriers, energy attenuators;

If ENVS is informed by the project proponent subsequent to this Memorandum that the design or scope of the project or non-project action has changed, ENVS shall review the nature of such changes and document whether or not new or additional SEPA documentation is appropriate for compliance with all applicable SEPA regulations.

Mary Auld, Senior Planner

WSDOT RAILROAD GRADE CROSSING
DIAGNOSTIC TEAM REVIEW WORKSHEET*

Reviewers : WSDOT (Ahmer Nizam, Chris Damitio, Cheryl Klopp, Mike Mansfield, Al Mattus), FHWA (Don Peterson), UTC (Kathy Hunter), ESFRR – Byron Cole

Date: June 27, 2013 (updated August 18, 2014, October 17, 2014)

Location: SR 524 Mile Post 14.3 (Yew or 212th) WSDOT Region: Northwest

Railroad: Eastside Freight Railroad (operator); Port of Seattle (owner)

USDOT No. 091814T

Highway Data

No. of lanes in each direction: One lane each direction

Are sidewalks or bike paths present? Yes ☐ No ☒

ADT: 6,800 (8.29% trucks) Roadway speed limit: 35MPH

School bus route? Yes ☒ No ☐ Unknown ☐

Truck route? Yes ☒ No ☐ Unknown ☐

Hazmat transporters? Yes ☐ No ☐ Unknown ☒

Crossing angle: 90 degrees

Approach curvature: N/A

Approach grades: SB approach includes a sag vertical curve to meet Yew Way

- Evidence of scrape marks at the crossing from low vehicle clearance? Yes

Comments on highway data
Railroad reports that low clearance trucks scrape the rails for the spur track. Grade adjustment would involve impacting a fish passage culvert under highway at this location.

*Crossing tentatively scheduled for grade separation in 10 to 15 years.

---

* This report of survey is undertaken in order to comply with 23 United States Code Section 130. The use of this data is governed by 23 United States Code Section 409 and shall not be subject to discovery or admitted into evidence in a federal or state court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Railway Data

No. of Tracks: 1 main, 1 spur

Trains per Day: 4 per week (2 round trips)
Update from November 2015: New rail customer will add 6-8 cars/month in 2016.

Train Speed Limit: 10 MPH

Approach curvature: N/A

Passenger Trains? No

Comments on railway data

Warning Devices (check all that apply)

☐ Gates	☐ Overhead flashing lights	☐ Shoulder-mounted flashing lights
☒ Crossbucks	☒ # Tracks sign	☐ Stop Bars

Chevron on crossbuck post

Are advance warning signs and pavement markings (including stop line) properly placed and in good condition? No

If "no" explain Need W10-1 signs on approaches

Note the presence of other warning or regulatory signs associated with the crossing. For example:

☐ Stop or Yield	☐ Exempt	☐ Do Not Stop on Tracks	☐ Skewed Crossing
☐ Low Clearance	☐ Other(s) _____		

Is the USDOT number posted? No

Is an emergency notification phone number posted? Yes, but it's the old BNSF number. Verify with RR if they have a separate emergency number.

Crossing Surface

☐Concrete ☒Asphalt ☐Timber ☐Rubber ☐Other_____

Comments on crossing surface

Railroad reports that low clearance trucks scrape the rails for the spur track. Grade adjustment would involve impacting a fish passage culvert under highway at this location.

UPDATE 8/18/2014: in August 2013 8 inches of asphalt was added which has helped with the trucks scraping on the tracks.

Sight Distance

Approach Sight Distance
Distance from the crossing along the E–bound highway approach that the crossing becomes clearly visible: Unobstructed

Distance from the crossing along the opposing highway approach that the crossing becomes clearly visible: T intersection with Yew Way immediately east of the crossing. Tracks are visible (and trains would be visible) from each approach on Yew.

Clearing Sight Distance
If the crossing has **no gates,** does the clearing sight distance meet the guidance criteria in Design Manual Figure 1350-1 (Case 1)? Yes

Sight Triangle
If the crossing is **passive**, does the sign triangle meet the guidance criteria in Design Manual Figure 1350-1 (Case 2)? Sight triangle is obstructed by vegetation in the NW and SW quadrants; however, this is mitigated by the fact that there is a stop condition at Yew Way (i.e. no thru moves without slowing down at tracks to stop at the highway intersection)

Is the crossing illuminated? Yes ☐ No ☒

Other Roadways

Are there any roadway intersections in the vicinity of the crossing that may cause traffic to queue back over the tracks? Yes ☒ No ☐

If yes:

- What is the available storage space? Approximately 30' from stop bar

Are traffic signals located within 200 feet of the crossing or otherwise contributing to vehicle queues approaching the tracks? No

If "yes", is Railroad Preemption provided? Yes ☐ No ☐

Comments/Observations

_____

_____

Accident Data

No. vehicle-train collisions in the last 5 years - 0

Fatal _____

Injury _____

Property Damage __1_____

* Property damage incident in 2003 involving truck-trailer. Report states that motorist *stopped and backed up*

No. non-train-related vehicle collisions at crossing in the last 5 years

Fatal 0

Injury 2

Property Damage 5

No. pedestrian-related incidents in the last 5 years - 0

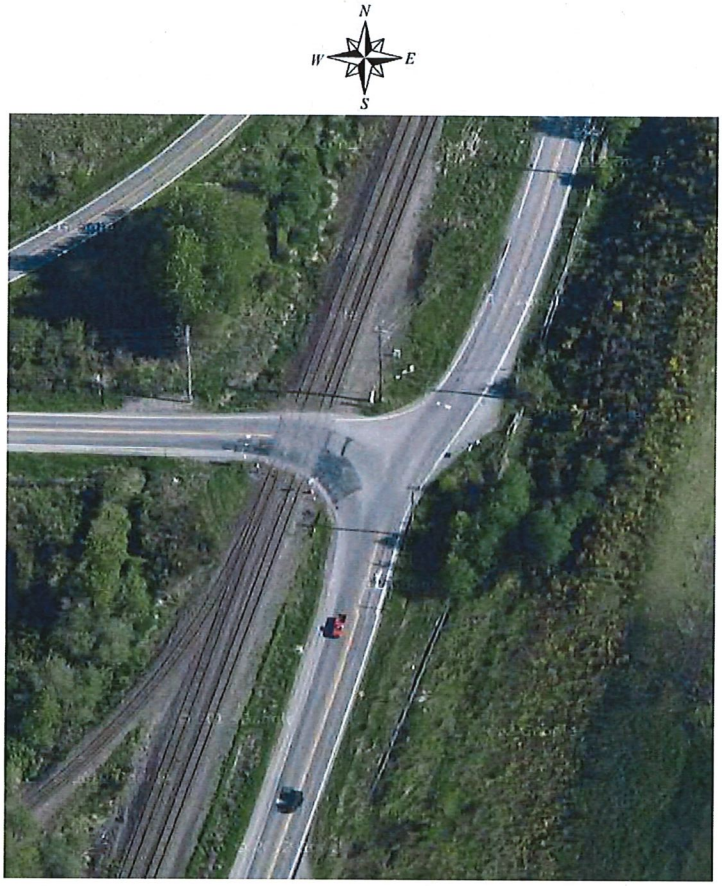
Fatal _____

Injury _____

Information on reported near misses between vehicles and trains at the crossing

None reported to WSDOT

Crossing Diagram



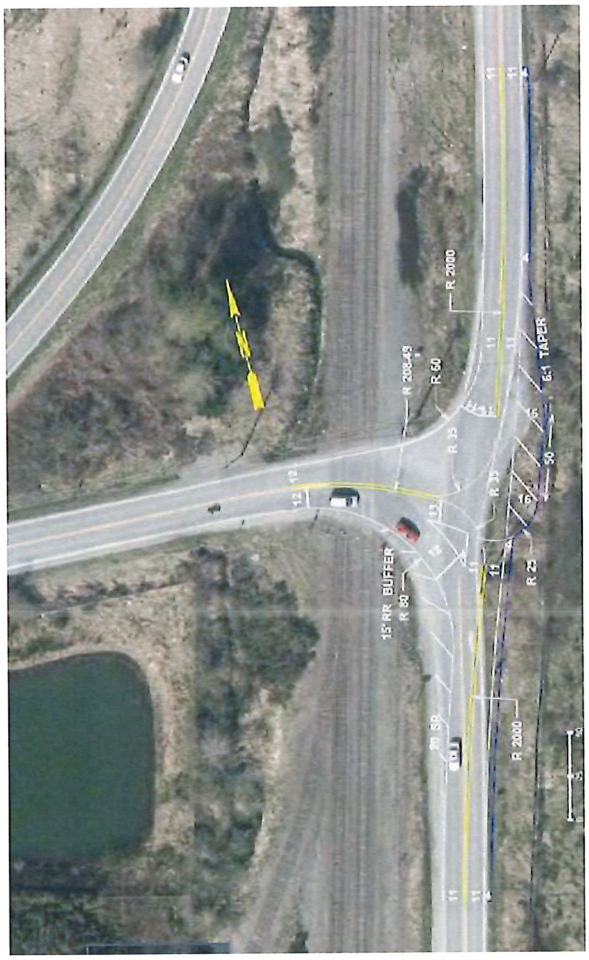
Recommendations/Action Items

Railroad Work

Install RR flashers at crossing

WSDOT Work

Modify configuration of SR 524 to move roadway east approximately 15 feet at the center of the intersection with Yew. The design should create enough storage for a school bus to remain clear of the tracks while stopped at SR 524 and Yew Way.


R 2000
R 200-49
R 50
R 35
R 25
15' RR BUFFER
R 80
R 2000
64 TAPER

Version 4-27-2006

Minnesota Department of Transportation

GUIDE FOR DETERMINING TIME REQUIREMENTS FOR TRAFFIC SIGNAL PREEMPTION AT HIGHWAY-RAIL GRADE CROSSINGS

City Woodinville

County Snohomish

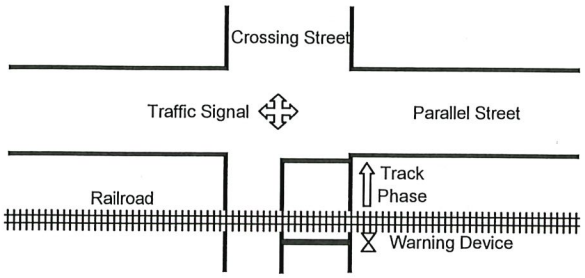
District

Date 10/01/19

Completed by Pasko Kesovija

District Approval

Show North Arrow



Parallel Street Name: Yew Way

Crossing Street Name: 212th/SR 524

Railroad Ballard Terminal RR Co

Crossing DOT# 091814T

Railroad Contact James Forgette

Phone (206) 799-1245

SECTION 1: RIGHT-OF-WAY TRANSFER TIME CALCULATION

Preempt verification and response time

			Remarks
1. Preempt delay time (seconds)	1.	0.0	
2. Controller response time to preempt (seconds)	2.	0.0	Controller type: ASC 2070
3. Preempt verification and response time (seconds): add lines 1 and 2	3.	0.0	

Worst-case conflicting vehicle time

			Remarks
4. Worst-case conflicting vehicle phase number	4.	2	
5. Minimum green time during right-of-way transfer (seconds)	5.	7.0	
6. Other green time during right-of-way transfer (seconds)	6.		
7. Yellow change time (seconds)	7.	3.9	
8. Red clearance time (seconds)	8.	2.0	
9. Worst-case conflicting vehicle time (seconds): add lines 5 through 8	9.	12.9	

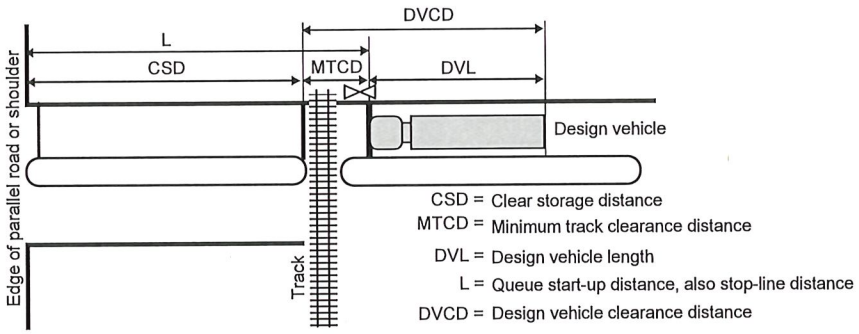
Worst-case conflicting pedestrian time

			Remarks
10. Worst-case conflicting pedestrian phase number	10.	6	
11. Minimum walk time during right-of-way transfer (seconds)	11.	0.0	
12. Pedestrian clearance time during right-of-way transfer (seconds)	12.	23.0	
13. Vehicle yellow change time, if not included on line 12 (seconds)	13.	3.9	
14. Vehicle red clearance time, if not included on line 12 (seconds)	14.	2.0	
15. Worst-case conflicting pedestrian time (seconds): add lines 11 through 14	15.	28.9	

Worst-case conflicting vehicle or pedestrian time

16. Worst-case conflicting vehicle or pedestrian time (seconds): maximum of lines 9 and 15	16.	28.9
17. Right-of-way transfer time (seconds): add lines 3 and 16	17.	28.9

SECTION 2: QUEUE CLEARANCE TIME CALCULATION



			Remarks
18. Clear storage distance (CSD, feet)	**18.**	29	
19. Minimum track clearance distance (MTCD, feet)	**19.**	34	
20. Design vehicle length (DVL, feet)	**20.**	75	Design vehicle type: WB-67
21. Queue start-up distance, L (feet): add lines 18 and 19	**21.**	63	
22. Time required for design vehicle to start moving (seconds): calculate as 2+(L÷20)	**22.**	5.2	Remarks
23. Design vehicle clearance distance, DVCD (feet): add lines 19 and 20	**23.**	109	
24. Time for design vehicle to accelerate through the DVCD (seconds)	**24.**	14.5	Read from Figure 2 in Instructions.
25. Queue clearance time (seconds): add lines 22 and 24	**25.**	19.7	

SECTION 3: MAXIMUM PREEMPTION TIME CALCULATION

			Remarks
26. Right-of-way transfer time (seconds): line 17	**26.**	28.9	
27. Queue clearance time (seconds): line 25	**27.**	19.7	
28. Desired minimum separation time (seconds)	**28.**	4.0	
29. Maximum preemption time (seconds): add lines 26 through 28	**29.**	52.6	

SECTION 4: SUFFICIENT WARNING TIME CHECK

				Remarks
30. Required minimum time, MT (seconds): per regulations	**30.**	20.0		
31. Clearance time, CT (seconds): get from railroad	**31.**	10.0		
32. Minimum warning time, MWT (seconds): add lines 30 and 31	**32.**		30.0	Excludes buffer time (BT)
33. Advance preemption time, APT, if provided (seconds): get from railroad	**33.**		0.0	
34. Warning time provided by the railroad (seconds): add lines 32 and 33	**34.**	30.0		
35. Additional warning time required from railroad (seconds): subtract line 34 from line 29, round up to nearest full second, enter 0 if less than 0	**35.**	23		

If the additional warning time required (line 35) is greater than zero, additional warning time has to be requested from the railroad. Alternatively, the maximum preemption time (line 29) may be decreased after performing an engineering study to investigate the possibility of reducing the values on lines 1, 5, 6, 7, 8, 11, 12, 13 and 14.

Remarks:

SECTION 5: TRACK CLEARANCE GREEN TIME CALCULATION (OPTIONAL)

Preempt Trap Check

36. Advance preemption time (APT) provided (seconds): ..... 36. 0.0 Line 33 only valid if line 35 is zero.

37. Multiplier for maximum APT due to train handling ..... 37. 1.60 See Instructions for details.

38. Maximum APT (seconds): multiply line 36 and 37 ..... 38. 0.0

39. Minimum duration for the track clearance green interval (seconds) 39. 15.0

Remarks

For zero advance preemption time

40. Gates down after start of preemption (seconds): add lines 38 and 39 ..... 40. 15.0

41. Preempt verification and response time (seconds): line 3 ..... 41. 0.0

42. Best-case conflicting vehicle or pedestrian time (seconds): usually 0..... 42. 0.0

Remarks

43. Minimum right-of-way transfer time (seconds): add lines 41 and 42 ..... 43. 0.0

44. Minimum track clearance green time (seconds): subtract line 43 from line 40 ..... 44. 15.0

Clearing of Clear Storage Distance

45. Time required for design vehicle to start moving (seconds), line 22 ..... 45. 5.2

46. Design vehicle clearance distance (DVCD, feet), line 23 ..... 46. 109

47. Portion of CSD to clear during track clearance phase (feet) ... 47. 29

Remarks

CSD* in Figure 3 in Instructions.

48. Design vehicle relocation distance (DVRD, feet): add lines 46 and 47 ..... 48. 138

49. Time required for design vehicle to accelerate through DVRD (seconds) ..... 49. 22.0 Read from Figure 2 in Instructions.

50. Time to clear portion of clear storage distance (seconds): add lines 45 and 49 ..... 50. 27.2

51. **Track clearance green interval (seconds): maximum of lines 44 and 50, round up to nearest full second ....** 51. 28

SECTION 6: VEHICLE-GATE INTERACTION CHECK (OPTIONAL)

52. Right-of-way transfer time (seconds): line 17 ..... 52. 28.9

53. Time required for design vehicle to start moving (seconds), line 22 ..... 53. 5.2

54. Time required for design vehicle to accelerate through DVL (on line 20, seconds) ..... 54. 5.0 Read from Table 3 in Instructions.

55. Time required for design vehicle to clear descending gate (seconds): add lines 52 though 54 ..... 55. 39.1

Remarks

56. Duration of flashing lights before gate descent start (seconds): get from railroad 56. 0.0

Remarks

57. Full gate descent time (seconds): get from railroad ..... 57.

58. Proportion of non-interaction gate descent time ..... 58. Read from Figure 5 in Instructions.

59. Non-interaction gate descent time (seconds): multiply lines 57 and 58 ..... 59. 0.0

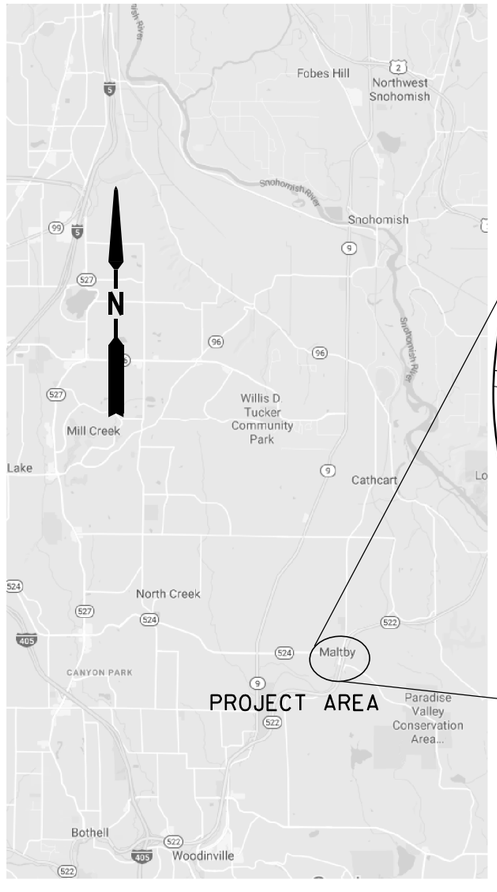
60. Time available for design vehicle to clear descending gate (seconds): add lines 56 and 59 ..... 60. 0.0

61. **Advance preemption time (APT) required to avoid design vehicle-gate interaction (seconds): subtract line 60 from line 55, round up to nearest full second, enter 0 if less than 0 ..... 61.** 40

SR 524/MALTBY RD
RAILROAD CROSSING SIGNAL

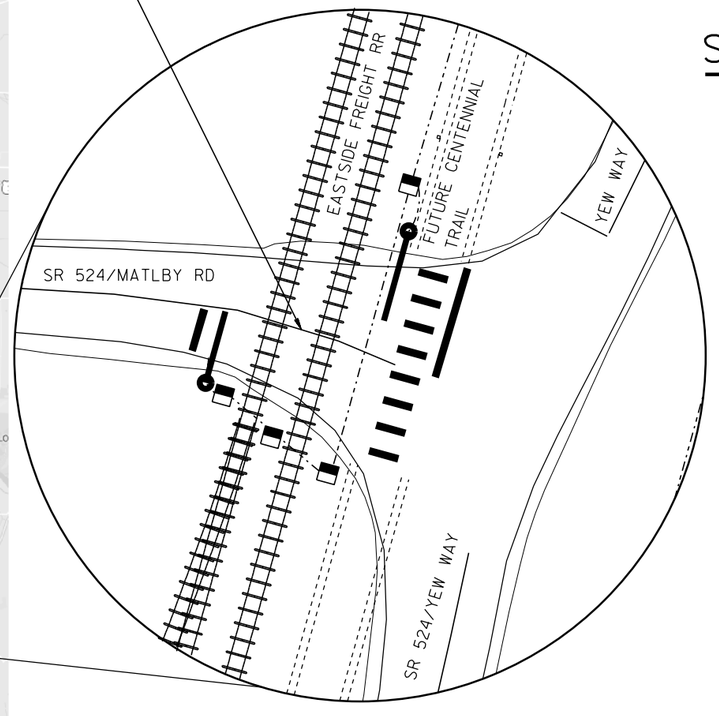
COUNTY # RR 6273, UPI # 17-0068
WSDOT AGREEMENT # RRB 1160
90% SUBMITTAL

SHEET INDEX



VICINITY MAP
N.T.S.

RAILROAD CROSSING - MP 30.04
USDOT #091814T
SR 524 - MP 14.3



Snohomish County Officials

DIRECTOR OF PARKS, RECREATION AND TOURISM
TOM TEIGEN

DIRECTOR OF PUBLIC WORKS
STEVEN E. THOMSEN, P.E.

COUNTY ENGINEER
DOUGLAS McCORMICK, P.E.

EXECUTIVE
DAVE SOMERS

COUNCIL MEMBERS
NATE NEHRING – DIST. 1
BRIAN SULLIVAN – DIST. 2
STEPHANIE WRIGHT – DIST. 3
TERRY RYAN – DIST. 4
SAM LOW – DIST. 5

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

LEGEND

- EXISTING RAILROAD C/L
- RIGHT OF WAY (ROW)
- PROP CROSSING GATE
- EXISTING SIGN
- PROP SIGN
- FUTURE TRAIL
- EX DITCHLINE
- EX VEGETATION
- PROPOSED PROJECT DESIGN ELEMENTS
- EX WATER LINE
- EX BURIED FIBER LINE
- EX STORM LINE
- EX GAS LINE
- TYPE 2 JUNCTION BOX
- TYPE 8 JUNCTION BOX
- TYPE 1 JUNCTION BOX
- SURVEY CONTROL MARKER

NOTES

1. THE INTERSECTION OF YEW WAY AND SR 524 WAS DESIGNED BY WSDOT. SEE WSDOT JOB NO. 19A008, SR524/YEW WAY RAILROAD CROSSING IMPROVEMENTS.

2. THE CENTENNIAL TRAIL IS BEING DESIGNED BY DAVID EVANS AND ASSOCIATES, INC. SEE CENTENNIAL TRAIL SOUTH, WOODINVILLE TO SNOHOMISH PLAN, SHEETS 26-27 & 69

3. HORIZONTAL DATUM: PROJECT DATUM, BASED ON CONVERTING STATE PLANE COORDINATES,(WASHINGTON NORTH ZONE, NAD 83(2011) ADJUSTMENT) BY SCALING UP AT BASE POINT 0,0 AND USING A MULTIPLICATION FACTOR OF 1.000057430 AND MOVING 100,000 METERS NORTH & 100,00 METERS EAST.

4. VERTICAL DATUM: NAVD88 (Geoid12a)

5. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS FOR CONFLICTS WITH EXISTING UTILITIES, SIGNAL CABLES / EQUIPMENT AND/OR OTHER ITEMS THAT MIGHT IMPAIR CONSTRUCTION ACTIVITIES. INCONSISTENCIES FOUND SHALL BE REPORTED TO THE ENGINEER.

6. IN THE EVENT THE CONTRACTOR, AS THE WORK PROGRESSES, FINDS ANY DISCREPANCIES BETWEEN THE PLANS AND THE PHYSICAL CONDITION OR ANY ERRORS IN THE PLANS OR LAYOUTS AS GIVEN BY STAKING OR INSTRUCTIONS IT SHALL BE THE CONTRACTOR'S DUTY TO INFORM THE ENGINEER IN WRITING, AND THE ENGINEER SHALL PROMPTLY ARRANGE CORRECTION THEREOF.

7. CONTRACTOR SHALL COORDINATE ACTIVITIES WITH RAILROAD OPERATOR (BALLARD TERMINAL RAILROAD) TO MINIMIZE IMPACTS TO OPERATIONS.
   CONTACT INFORMATION:
   JAMES FORGETTE
   BALLARD TERMINAL RAILROAD COMPANY, LLC
   4725 BALLARD AVE NW
   SEATTLE, WA 98107
   OFFICE: 206-781-1176
   MOBILE: 206-799-1245
   JR.FORGETTE@BDTLRR.COM

8. THIS PUBLIC RAILROAD GRADE CROSSING AT SR 524/MALTBY RD IS IDENTIFIED AS USDOT 091814T

9. 1-800-424-5555 (OR 811) MUST BE CALLED NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVTION WEHRE ANY UNDERGROUND UTILITIES MAY BE LOCATED. FAILURE TO DO SO COULD MEAN BEARING SUBSTANTIAL REPAIR COSTS (UP TO THREE TIMES THE COST OF REPAIRS TO THE SERVICE).

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

PLAN CHECK	BY	DATE					
			DATE	NO.	REVISION	BY	

Last Saved By : DJbe 9/24/2019 11:06 AM

REGION NO.	STATE	FED. AID PROJ. NO.	SURVEY NO.
10	WASH.		

DESIGNED BY: M. MORAN | DRAWN BY: D. BENTZ

FIELD BOOK(S): | UPI#

DAVID EVANS AND ASSOCIATES INC.
2106 Pacific Avenue Suite 400
Tacoma, Washington 98402
Phone: 253.922.9780

90 PERCENT SUBMITTAL

SNOHOMISH COUNTY DEPARTMENT OF PUBLIC WORKS

FUNDING NO. _____

SR 524/MALTBY ROAD
RAILROAD CROSSING SIGNAL

LEGEND/NOTES

REFERENCE SHEET NO.

SHEET 2 OF 23 SHEETS

Plot Date: 9/24/2019 11:06 AM
By: Daniel Bentz
By: DJbe
File: \\deainc.com\files\PROJECTS\SCWX000001591\0400CAD\ECIS\SHEETS\2234_SCWX-0159-TB - RRXING.dwg

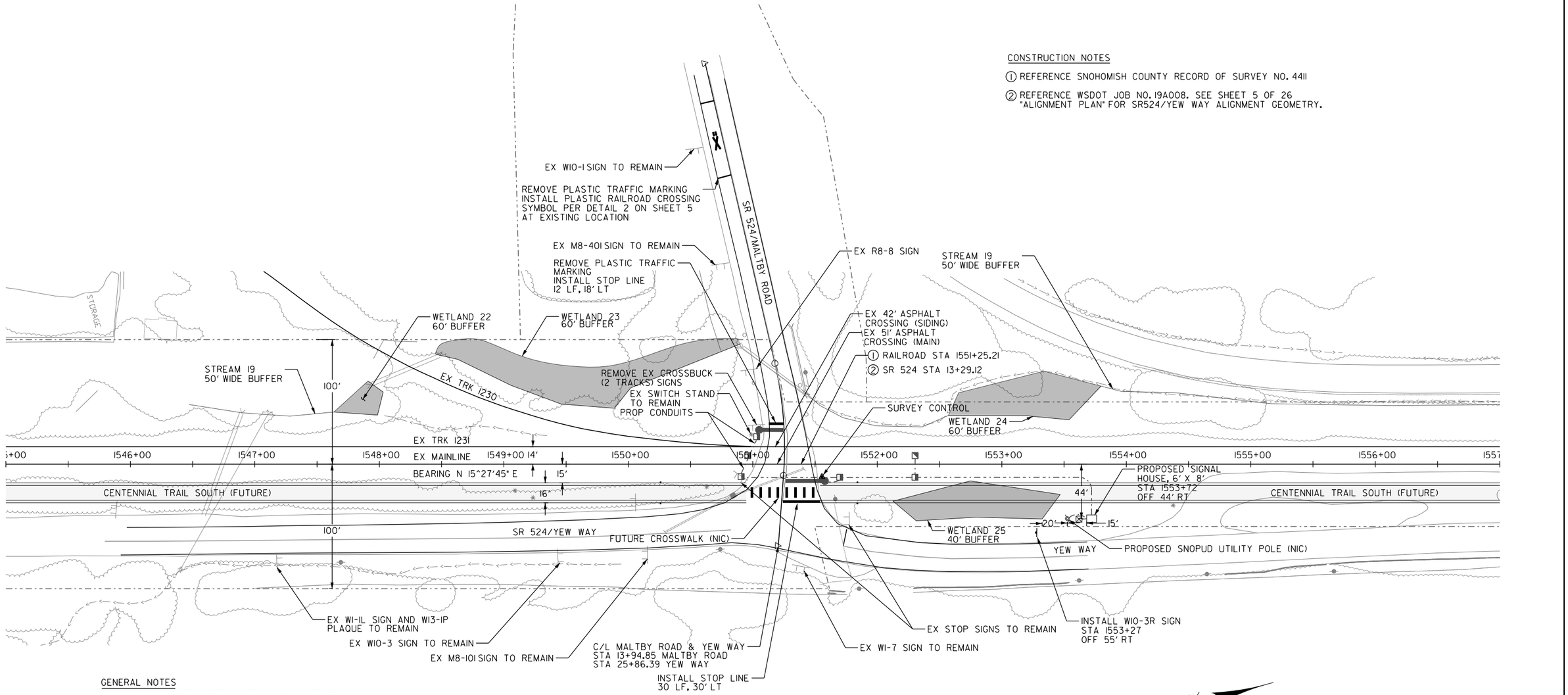
TO BLACK RIVER, WA
SOUTHWARD

TO SNOHOMISH JCT WEST, WA
NORTHWARD

CONSTRUCTION NOTES

① REFERENCE SNOHOMISH COUNTY RECORD OF SURVEY NO. 4411

② REFERENCE WSDOT JOB NO. 19A008. SEE SHEET 5 OF 26 "ALIGNMENT PLAN" FOR SR524/YEW WAY ALIGNMENT GEOMETRY.



GENERAL NOTES

1. ANY EXCAVATION CLOSER THAN 15' TO TRACKS REQUIRES SHORING PLAN BY CONTRACTOR
2. SEE SNOHOMISH COUNTY ENGINEERING DESIGN AND DEVELOPMENT STANDARDS (EDDS) CHAPTER 8 FOR GUIDELINES REGARDING TRENCHING AND BORING OF UTILITIES AND CONDUITS.
3. STATION AND OFFSET TO PROPOSED STRUCTURE IS TO CENTER OF PROPOSED STRUCTURE

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

By: Daniel Bentz
By: Djbe
File: \\deainc.com\files\PROJECTS\SCVX\0000015910400\ADE\SHEETS\2234_SCVX-0159-TB - RRXING.dwg

Plot Date: 9/24/2019 11:06 AM
Save Date: 9/24/2019 11:06 AM

PLAN CHECK	BY	DATE

DATE	NO.	REVISION	BY

Last Saved By : Djbe 9/24/2019 11:06 AM

REGION NO.	STATE	FED. AID PROJ. NO.	SURVEY NO.
10	WASH.		

DESIGNED BY: M. MORAN
DRAWN BY: D. BENTZ
FIELD BOOK(S):
UPI#

DAVID EVANS AND ASSOCIATES INC.
2106 Pacific Avenue Suite 400
Tacoma, Washington 98402
Phone: 253.922.9780

90 PERCENT SUBMITTAL

SNOHOMISH COUNTY DEPARTMENT OF PUBLIC WORKS

FUNDING NO. _____

SR 524/MALTBY ROAD
RAILROAD CROSSING SIGNAL

RAILROAD CROSSING PLAN

REFERENCE SHEET NO.

SHEET 3 OF 23 SHEETS

TO BLACK RIVER, WA
SOUTHWARD

TO SNOHOMISH JCT WEST, WA
NORTHWARD

SEE ② FOR ALIGNMENT INFORMATION

SR 524/MALTBY ROAD

REMOVE EX CROSSBUCK (2 TRACKS) SIGN

PROPOSED GATE AND LIGHTS
STA 1551+05 MT
OFF 27.5' LT

STA 1551+03
OFF 22' LT

EX SWITCH STAND

PROPOSED CONDUITS
2" (2 - FOR WSDOT)
4" (2 - RR SPARE)
4" (1 - RAILROAD)

13.5'

STA 1550+96
OFF 7' LT

③

EX TRK 1231

14'

③

1551+00

15'

EX MAINLINE
BEARING N 15°27'45" E

STA 1550+91
OFF 8' RT

③ PROPOSED CONDUITS
4" (2 - RR SPARE)
4" (1 - RAILROAD)

① RAILROAD STATION 1551+25.21
② SR 524 STATION 13+29.12

85'

RAILROAD CROSSING

13.5'

SURVEY CONTROL

STA 1551+70
OFF 8' RT

PROPOSED CONDUITS
4" (2 - RR SPARE)
4" (1 - RAILROAD)

1552+00

STA 1552+30
OFF 7' LT

③ PROPOSED CONDUIT
4" (1 - RAILROAD)

STA 1552+30
OFF 8' RT

PROPOSED CONDUITS
4" (2 - RR SPARE)
4" (1 - RAILROAD)

1553+00

SEE SHEET 3 FOR
RR HOUSE LOCATION

STREAM 19
50' WIDE BUFFER

WETLAND 24
60' BUFFER

10 0 10 20
SCALE IN FEET

PROPOSED GATE AND LIGHTS
STA 1551+58
OFF 13.5' RT

CENTENNIAL TRAIL SOUTH
(FUTURE)

16'

EX CB

EX UTILITY POLE

WETLAND 25
40' BUFFER

SR524/YEW WAY

YEW WAY

GENERAL NOTES

1. ANY EXCAVATION CLOSER THAN 15' TO TRACKS REQUIRES SHORING PLAN BY CONTRACTOR
2. SEE SNOHOMISH COUNTY ENGINEERING DESIGN AND DEVELOPMENT STANDARDS (EDDS) CHAPTER 8 FOR GUIDELINES REGARDING TRENCHING AND BORING OF UTILITIES AND CONDUITS.
3. STATION AND OFFSET TO PROPOSED STRUCTURE IS TO CENTER OF PROPOSED STRUCTURE

CONSTRUCTION NOTES

① REFERENCES SNOHOMISH COUNTY RECORD OF SURVEY NO. 4411

② REFERENCES WSDOT JOB NO. 19A008. SEE SHEET 5 OF 26 "ALIGNMENT PLAN" FOR SR524/YEW WAY ALIGNMENT GEOMETRY

③ INSTALL CONDUIT BY BORING

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

PLAN CHECK	BY	DATE	DATE	NO.	REVISION	BY

Last Saved By : DJbe 9/24/2019 11:06 AM

REGION NO.	STATE	FED. AID PROJ. NO.	SURVEY NO.
10	WASH.		

DESIGNED BY: M. MORAN
DRAWN BY: D. BENTZ
FIELD BOOK(S):
UPI#

DAVID EVANS AND ASSOCIATES INC.
2106 Pacific Avenue Suite 400
Tacoma, Washington 98402
Phone: 253.922.9780

90 PERCENT SUBMITTAL

SNOHOMISH COUNTY
DEPARTMENT OF
PUBLIC WORKS

FUNDING NO. _____

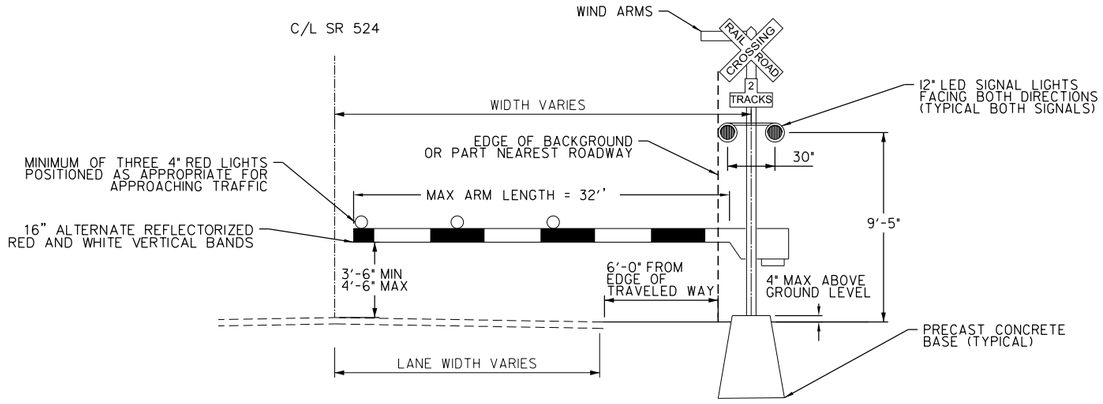
SR 524/MALTBY ROAD
RAILROAD CROSSING SIGNAL

CROSSING PLAN 10' SCALE

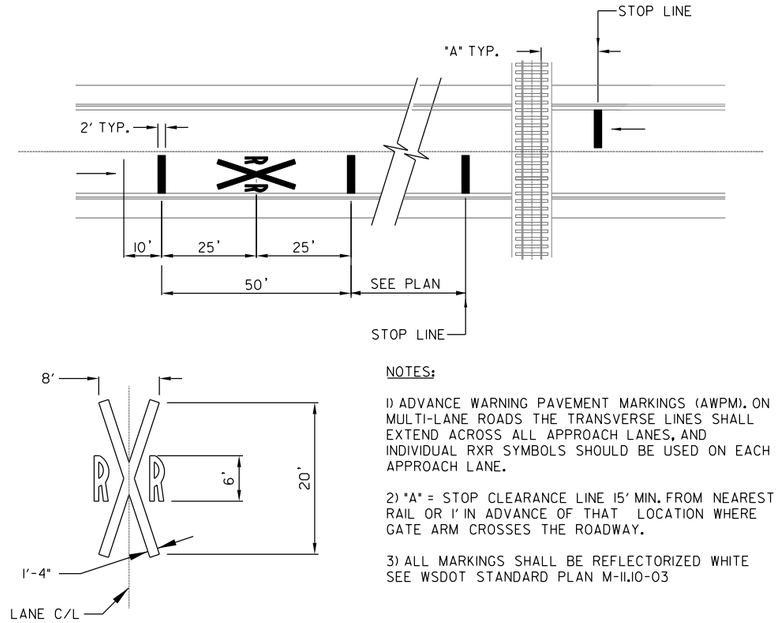
REFERENCE SHEET NO.

SHEET 4 OF 23 SHEETS

Plot Date: 9/24/2019 11:06 AM
Save Date: 9/24/2019 11:06 AM
By: Daniel Bentz
By: DJbe
File: \\deiainc.com\files\PROJECTS\SCWX000001590\400CADIEC\SHEETS\2234_SCWX-0159-TB - RRXING.dwg



1 TRAFFIC CONTROL DETAIL
N.T.S.



NOTES:

1) ADVANCE WARNING PAVEMENT MARKINGS (AWPM). ON MULTI-LANE ROADS THE TRANSVERSE LINES SHALL EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL RXR SYMBOLS SHOULD BE USED ON EACH APPROACH LANE.

2) "A" = STOP CLEARANCE LINE 15' MIN. FROM NEAREST RAIL OR 1' IN ADVANCE OF THAT LOCATION WHERE GATE ARM CROSSES THE ROADWAY.

3) ALL MARKINGS SHALL BE REFLECTORIZED WHITE SEE WSDOT STANDARD PLAN M-11.10-03

2 PAVEMENT MARKING
1" = 20'

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

PLAN CHECK	BY	DATE					
			DATE	NO.	REVISION	BY	

Last Saved By : Djbe 9/24/2019 11:06 AM

REGION NO.	STATE	FED. AID PROJ. NO.	SURVEY NO.
10	WASH.		

DESIGNED BY: M. MORAN | DRAWN BY: D. BENTZ | FIELD BOOK(S): | UPI#

DAVID EVANS AND ASSOCIATES INC.
2106 Pacific Avenue Suite 400
Tacoma, Washington 98402
Phone: 253.922.9780

90 PERCENT SUBMITTAL

SNOHOMISH COUNTY DEPARTMENT OF PUBLIC WORKS

FUNDING NO. _____

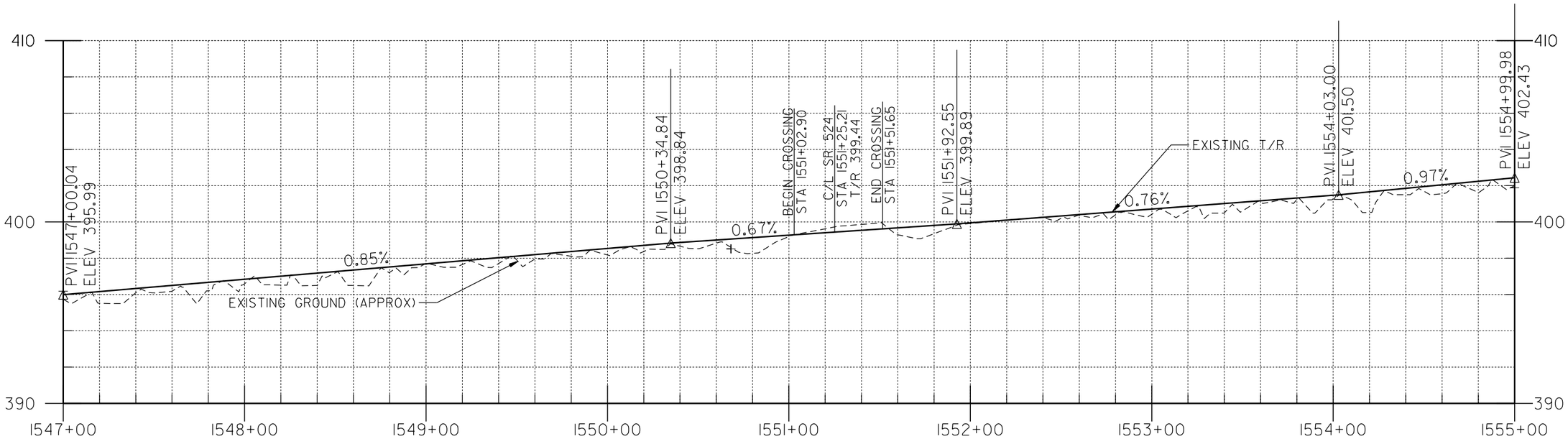
SR 524/MALTBY ROAD RAILROAD CROSSING SIGNAL

CROSSING DETAILS

REFERENCE SHEET NO.

SHEET 5 OF 23 SHEETS

By: Daniel Bentz
By: Djbe
File: \\dei-inc.com\dfs\PROJECTS\SCWX000015900400\CAD\EC\SHEETS\2234_SCWX-0159-TB - RRXING.dwg
Plot Date: 9/24/2019 11:06 AM
Save Date:



EXISTING RAILROAD MAINLINE

30 0 30 60
SCALE IN FEET

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

By: Daniel Bentz
By: Djbe
File: \\dei-inc.com\dfs\PROJECTS\SCWX\0000159\040\CAD\EC\SHEETS\2234_SCWX-0159-TB - RRXING.dwg

Plot Date: 9/24/2019 11:06 AM
Save Date: 9/24/2019 11:06 AM

PLAN CHECK	BY	DATE					
			DATE	NO.	REVISION	BY	

Last Saved By : Djbe 9/24/2019 11:06 AM

REGION NO.	STATE	FED. AID PROJ. NO.	SURVEY NO.
10	WASH.		

DESIGNED BY: M. MORAN | DRAWN BY: D. BENTZ | FIELD BOOK(S): | UPI#

DAVID EVANS AND ASSOCIATES INC.
2106 Pacific Avenue Suite 400
Tacoma, Washington 98402
Phone: 253.922.9780

90 PERCENT SUBMITTAL

SNOHOMISH COUNTY
DEPARTMENT OF
PUBLIC WORKS

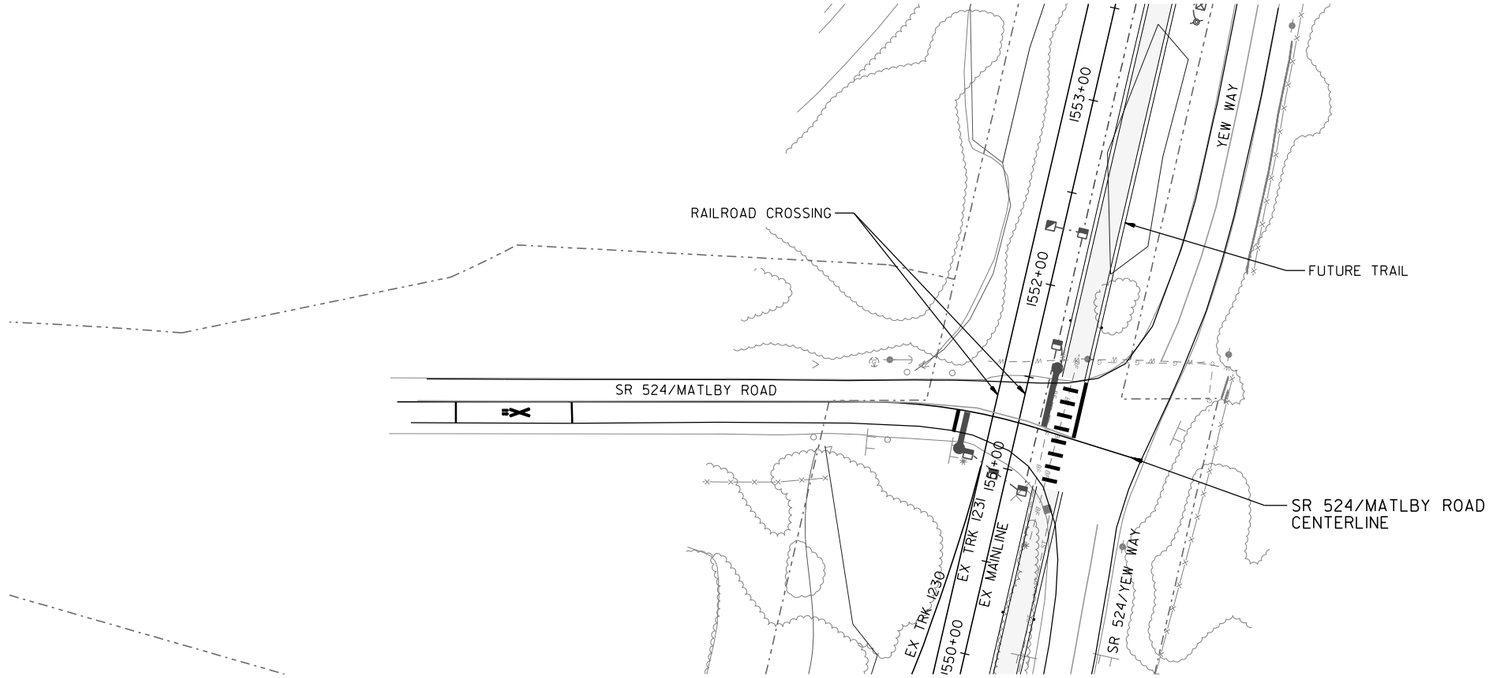
FUNDING NO. _____

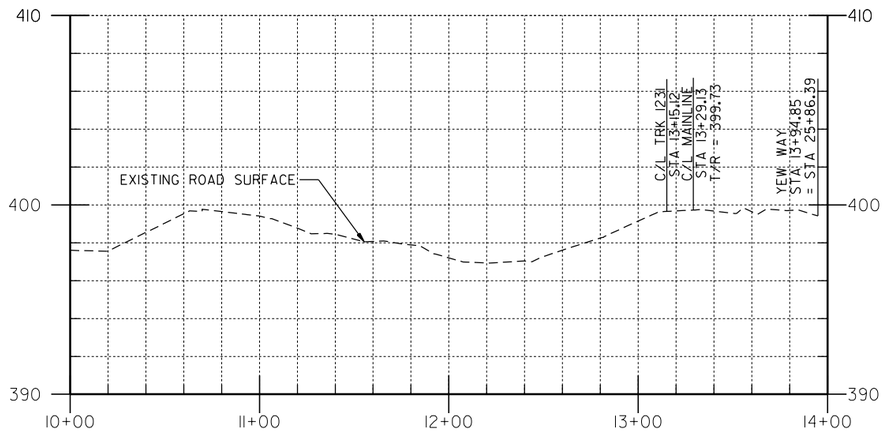
SR 524/MALTBY ROAD
RAILROAD CROSSING SIGNAL

RAILROAD PROFILE

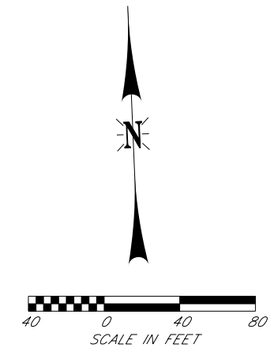
REFERENCE SHEET NO.

SHEET 6 OF 23 SHEETS





SR 524/MALTBY ROAD



Know what's below. Call before you dig.

PLAN CHECK	BY	DATE					
			DATE	NO.	REVISION	BY	

Last Saved By : DJbe 9/24/2019 11:06 AM

REGION NO.	STATE	FED. AID PROJ. NO.	SURVEY NO.
10	WASH.		

DESIGNED BY: M. MORAN | DRAWN BY: D. BENTZ

FIELD BOOK(S): | UPI#

DAVID EVANS AND ASSOCIATES INC.
2106 Pacific Avenue Suite 400
Tacoma, Washington 98402
Phone: 253.922.9780

90 PERCENT SUBMITTAL

SNOHOMISH COUNTY DEPARTMENT OF PUBLIC WORKS

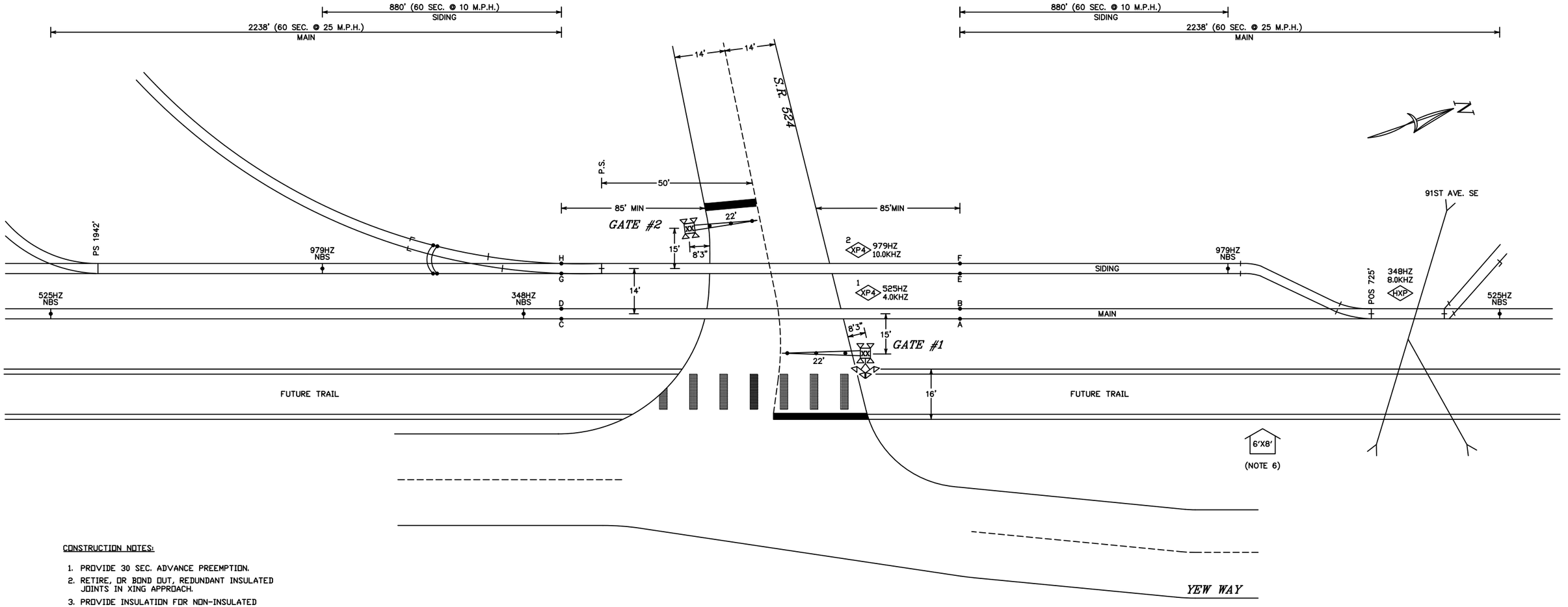
FUNDING NO. _____

SR 524/MALTBY ROAD RAILROAD CROSSING SIGNAL MALTBY RD PLAN AND PROFILE

REFERENCE SHEET NO.

SHEET 7 OF 23 SHEETS

By: Daniel Bentz
By: DJbe
File: \\deainc.com\files\PROJECTS\SCVX\0000015910400CAD\ESIHEETS\2234_SCVX-0159-TB - RRXING.dwg
Plot Date: 9/24/2019 11:06 AM
Save Date:



CONSTRUCTION NOTES:

1. PROVIDE 30 SEC. ADVANCE PREEMPTION.
2. RETIRE, OR BOND OUT, REDUNDANT INSULATED JOINTS IN XING APPROACH.
3. PROVIDE INSULATION FOR NON-INSULATED SWITCHES IN CROSSING APPROACH.
4. ALL NON-INSULATED JOINTS TO BE DOUBLE BONDED. EXISTING BONDS MAY BE REUSED. DETERMINATION OF SUITABILITY OF BONDS FOR REUSE TO BE MADE BY THE OWNER.
5. REMOVE EXISTING HARDWIRE SHUNT FOR 91ST AVE. SE LOCATED 58' NORTH OF EDGE OF ROAD AND INSTALL 348HZ NBS OUTSIDE TRACK CONNECTIONS SOUTH OF ROADWAY.
6. REFERENCE SHEET 3 OF DRAWING SET FOR LOCATION OF 6'X8' HOUSE.
7. LOCATE TRACK CONNECTIONS A MINIMUM OF 85' FROM NEAR EDGE OF ROADWAY TO ACCOMODATE FUTURE WIDENING.

LEGEND:

- ⊗—○ = TEST LINK
- ∠ = HEAVY DUTY LIGHTNING ARRESTER
- ◿ = HEAVY DUTY EQUALIZER
- 6 = TWISTED 2 TURNS PER FOOT.
- XX = BELL
- ☆ = INSULATED NUT.
- JB = JUNCTION BOX

ALL WIRING #16 AWG UNLESS OTHERWISE NOTED. ALL SHEETS.

APPROACH AND WARNING TIME CALCULATION	SIDING
MINIMUM WARNING TIME	25 SEC
PLUS CLEARANCE TIME	0 SEC
PLUS ADDITIONAL GATE DELAY	0 SEC
ERT	5 SEC
TOTAL WARNING TIME	30 SEC
TOTAL WARNING TIME	30 SEC
PED CLEAROUT	0 SEC
PLUS ADVANCE PREEMPT	30 SEC
TOTAL APPROACH TIME	60 SEC
MAXIMUM TRAIN SPEED	10 MPH
TIMES RATIO OF FT/SEC TO MPH	1.4667
TOTAL APPROACH DISTANCE	880 FT.

APPROACH AND WARNING TIME CALCULATION	MAIN
MINIMUM WARNING TIME	25 SEC
PLUS CLEARANCE TIME	0 SEC
PLUS ADDITIONAL GATE DELAY	0 SEC
ERT	5 SEC
TOTAL WARNING TIME	30 SEC
TOTAL WARNING TIME	30 SEC
PED CLEAROUT	0 SEC
PLUS ADVANCE PREEMPT	30 SEC
TOTAL APPROACH TIME	60 SEC
MAXIMUM TRAIN SPEED	25 MPH
TIMES RATIO OF FT/SEC TO MPH	1.4667
TOTAL APPROACH DISTANCE	2238 FT.

CROSSING TRACK PLAN

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

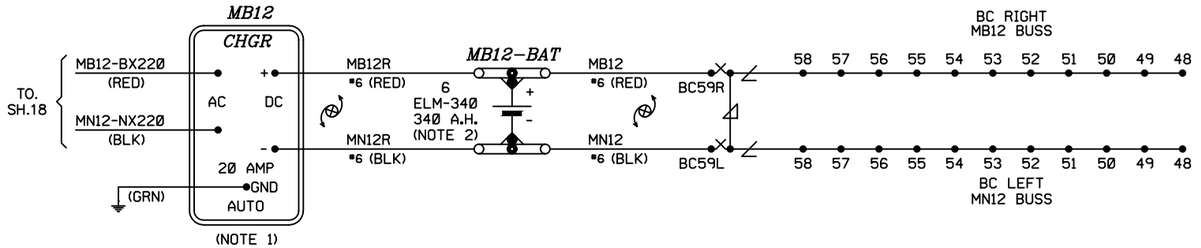
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

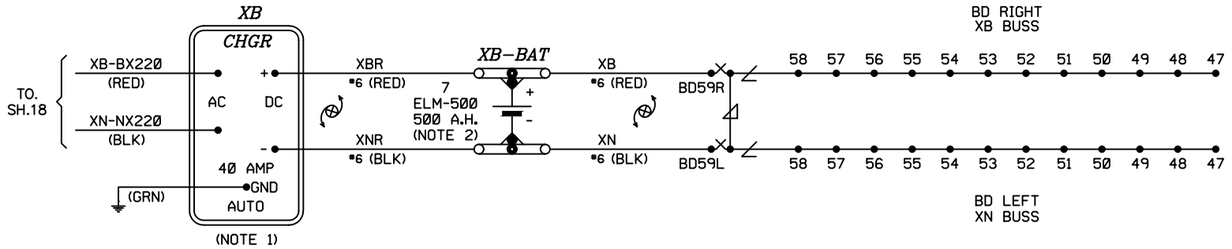
DATE 05/14/2019

008

08 OF 22

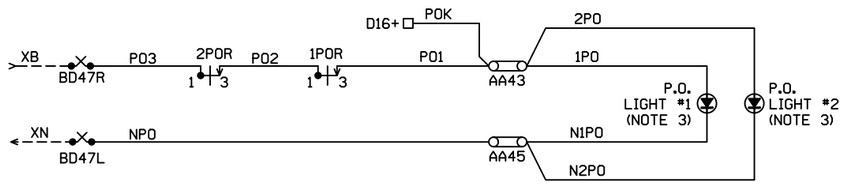
RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-008.dwg





NOTES:

1. USE 240 VOLT SETTING.
2. USE 1/4" TERMINALS AT BATTERY CONNECTIONS.
3. 1PO LAMP MOUNTED ON OUTSIDE OF WALL A.
   2PO LAMP MOUNTED ON OUTSIDE OF WALL C.



RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-009.dwg

DC POWER DISTRIBUTION

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

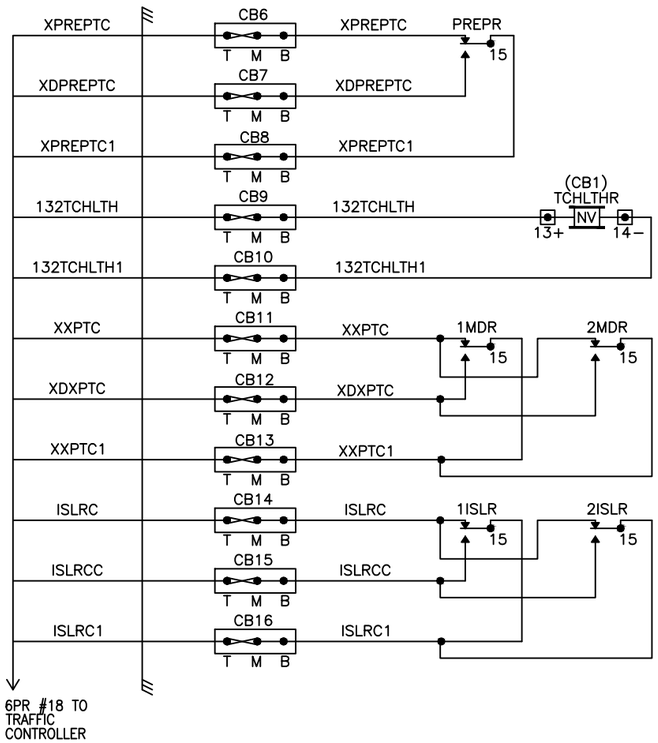
SR 524

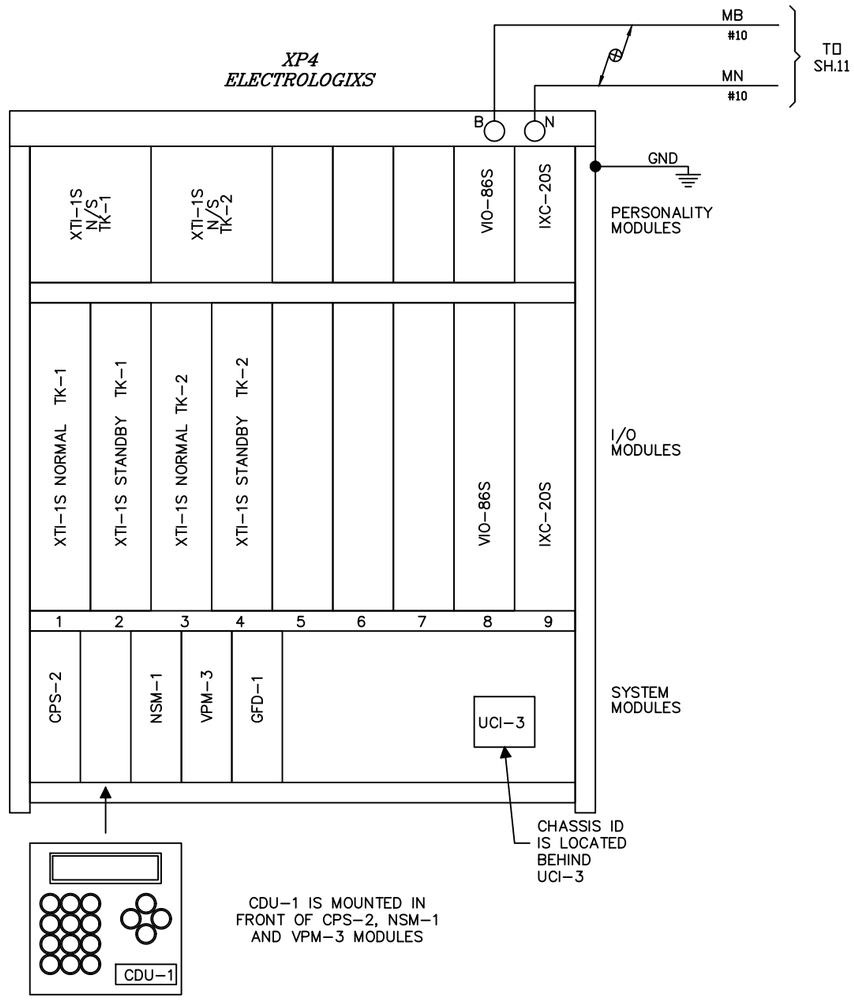
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

009

09 OF 22





NOTES:

1. ALL BUNGALOW WIRING ON THIS SHEET TO BE #16 UNLESS OTHERWISE NOTED.

TRAFFIC CONTROLLER INTERFACE

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-010.dwg

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

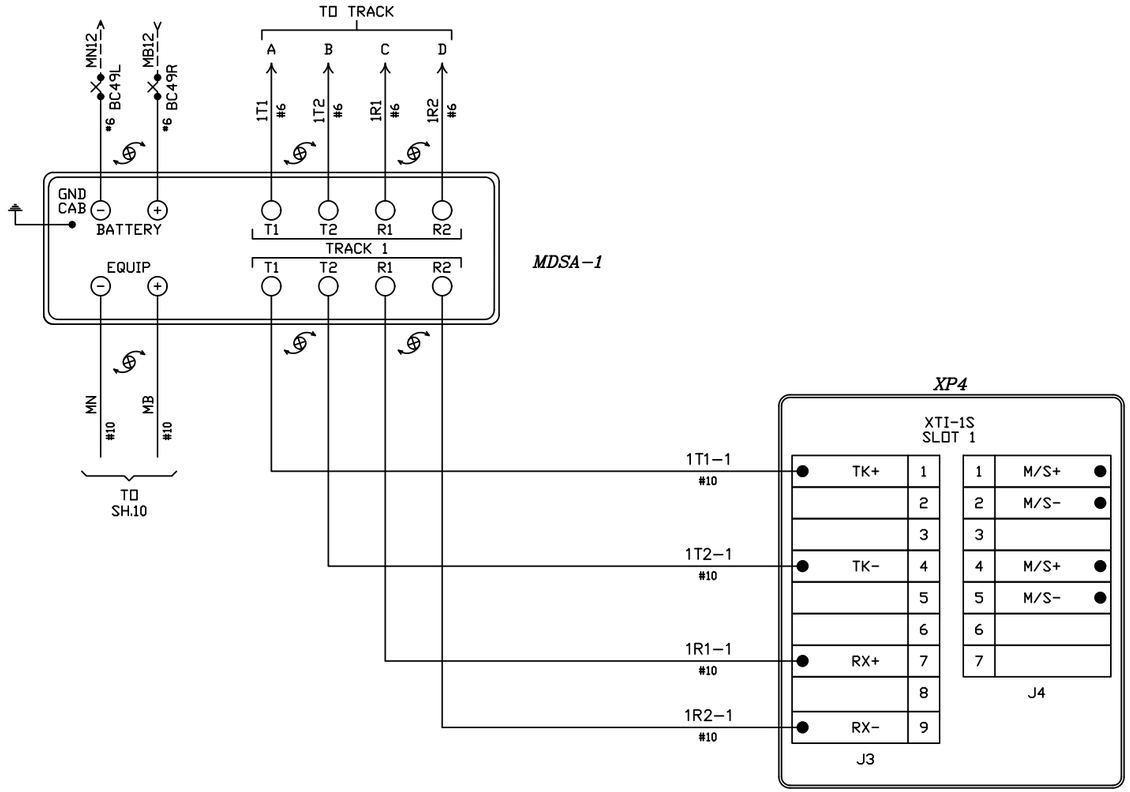
SR 524

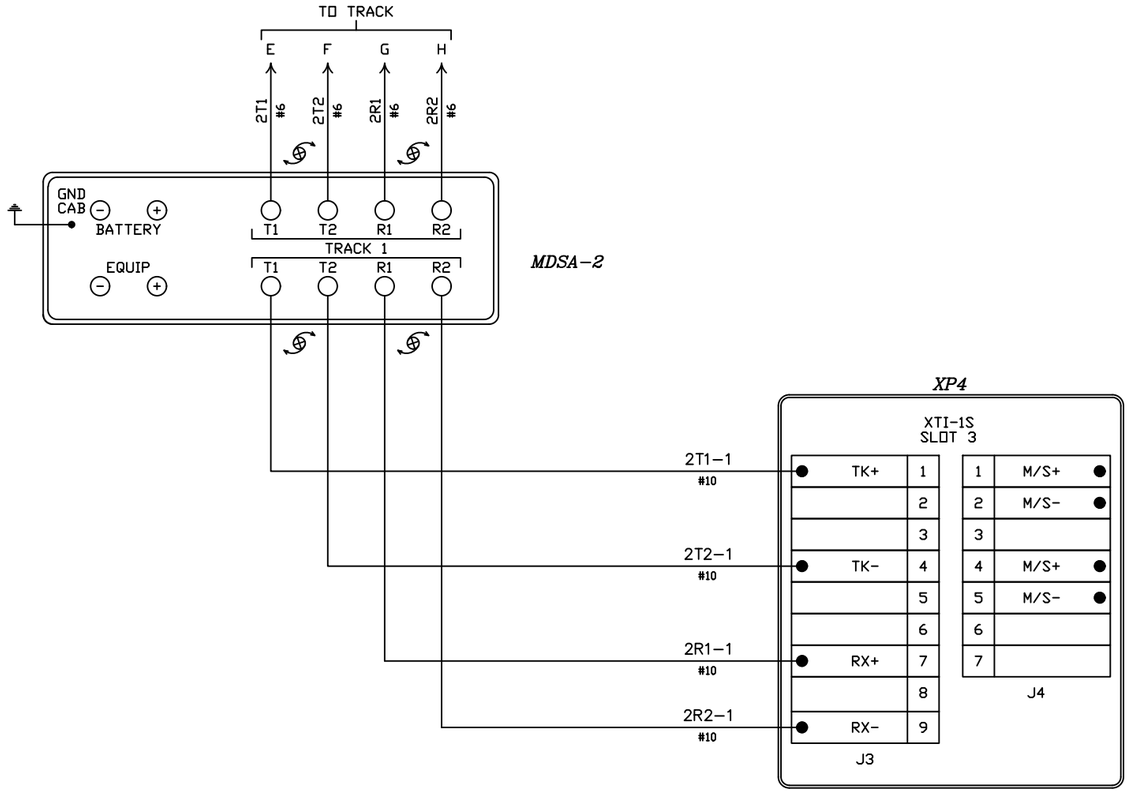
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

010

10 OF 22





XTI INTERFACE

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-011.dwg

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

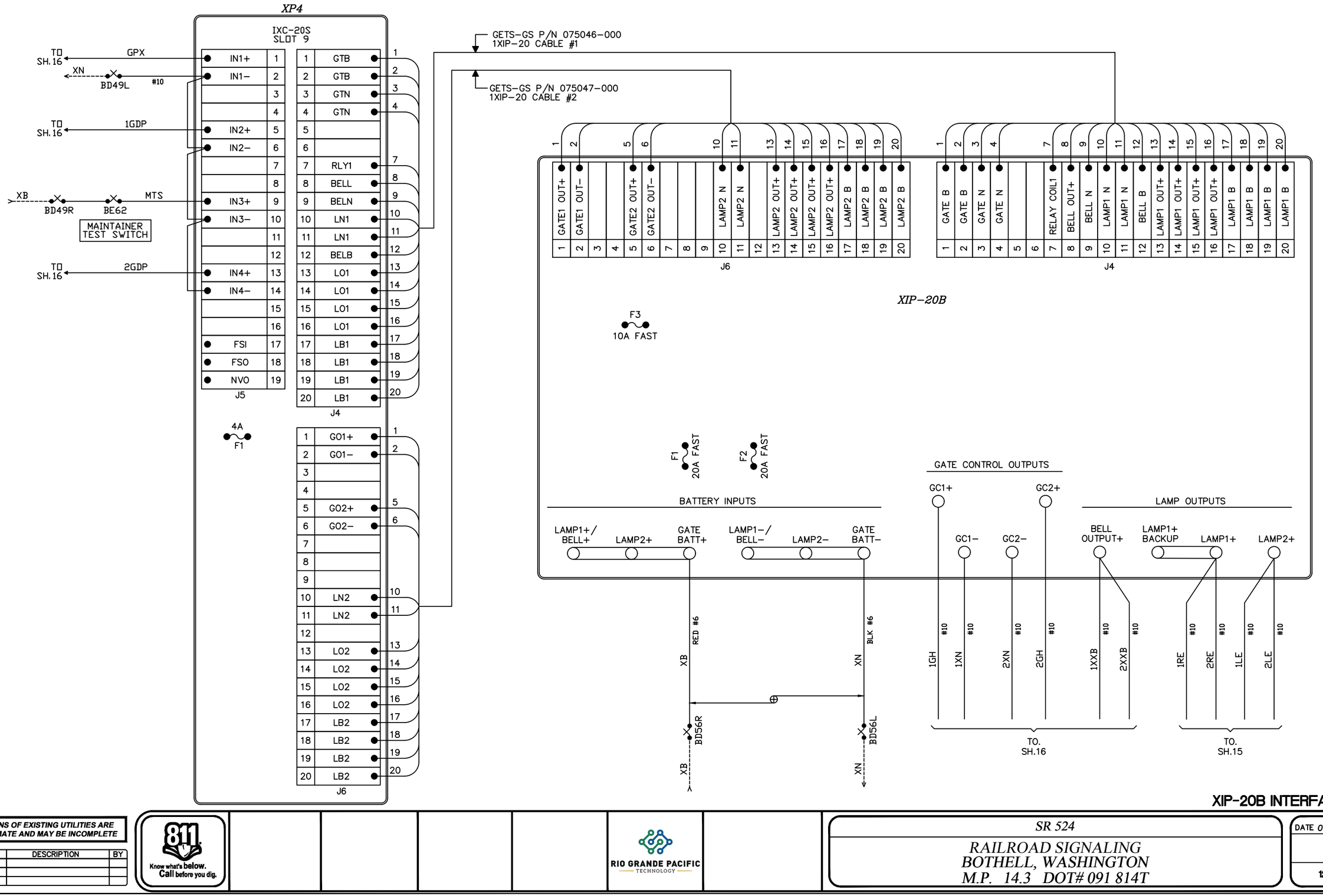
SR 524

RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE *05/14/2019*

011

11 OF 22



XIP-20B INTERFACE

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

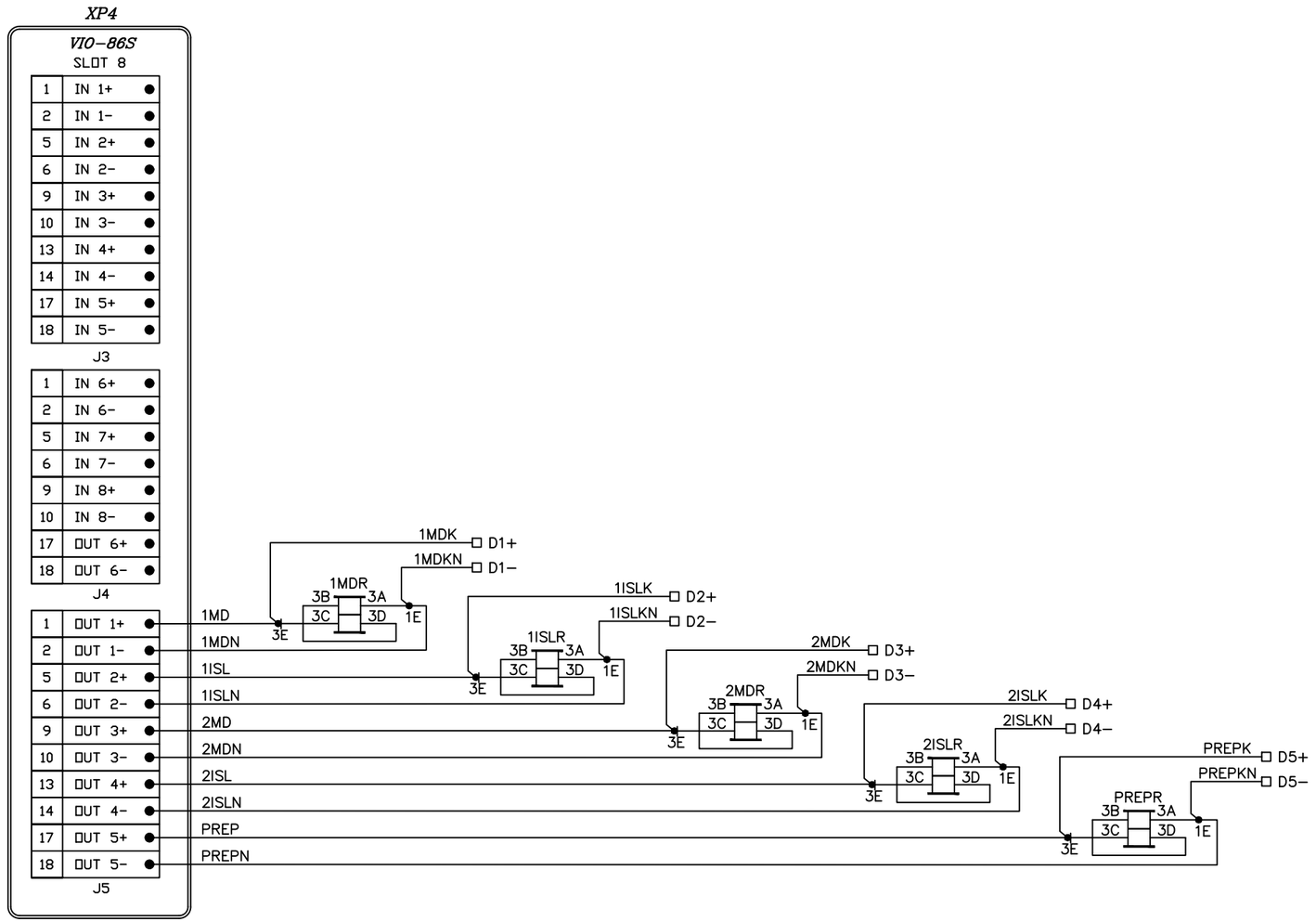
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

012

12 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-012.dwg



XP4 MODULE PLAN

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE *05/14/2019*

013

13 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-013.dwg

MDR SETUP																								
		MDR1				MDR2				MDR3				MDR4				MDR5				MDR6			
NAME		XR				PRER																			
WARNING TIME		28 SEC				60 SEC																			
CW/MD		CW				CW																			
AP TIME		30 SEC				0 SEC																			
CWE–WT		0 SEC				0 SEC																			
AUX RECOVERY DELAY		0 SEC				0 SEC																			
		TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4
TRACK ASSIGNED		ASSIGN	ASSIGN			ASSIGN	ASSIGN																		
OFFSET DISTANCE		0 FT	0 FT			0 FT	0 FT																		
MD RESTART		0	0			0	0																		
SUDDEN SHUNT ZONE		0	0			0	0																		
POSITIVE START	PSEN	DISABLE	DISABLE			DISABLE	DISABLE																		
	PSRX																								
	PST																								
POST JOINT DETECT	PJEN	DISABLE	DISABLE			DISABLE	DISABLE																		
	PJRX																								
	PJDT																								

MDR SETUP																								
		MDR7				MDR8				MDR9				MDR10				MDR11				MDR12			
NAME																								
WARNING TIME																								
CW/MD																								
AP TIME																								
CWE–WT																								
AUX RECOVERY DELAY																								
		TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4	TK1	TK2	TK3	TK4
TRACK ASSIGNED																									
OFFSET DISTANCE																									
MD RESTART																									
SUDDEN SHUNT ZONE																									
POSITIVE START	PSEN																								
	PSRX																								
	PST																								
POST JOINT DETECT	PJEN																								
	PJRX																								
	PJDT																								

BASIC TRACK SETUP				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
FREQUENCY	525 HZ	979 HZ		
MASTER/SLAVE	MASTER	MASTER		
RX ADJUST	100	100		
TCA	–3.9	–3.9		
DIRECTION MODE	BI	BI		
LIA	0	0		
ADVANCED APR. CAL	INACTIVE	INACTIVE		
NBS COMP RX	80	80		
TRK ISLAND ASSIGN	ISL1	ISL2		
APPROACH LENGTH	2238 FT	880 FT		
AUTO RX	ENABLE	ENABLE		

ADVANCE TRACK SETUP					
		TRACK 1	TRACK 2	TRACK 3	TRACK 4
MOTION DET TIMER	MDEN	ENABLE	ENABLE		
	MDTT	10 MIN	10 MIN		
FALSE SHUNT	FSEN	DISABLE	DISABLE		
	FSRX				
	FST				
APPROACH RELEASE	AREN	DISABLE	DISABLE		
	ARRX				
	ART				
LOS TIME		16 SEC	16 SEC		
IJ–LOS TIME		5 SEC	5 SEC		
NRML_SHRT_VRYSHRT		NRML *	NRML *		

ISLAND SETUP				
	TRACK 1	TRACK 2	TRACK 3	TRACK 4
ENABLE/DISABLE	ENABLE	ENABLE		
FREQUENCY	4.0 KHZ	10.0 KHZ		
LOSS OF SHUNT	2 SEC	2 SEC		
FAULT DELAY	1	1		

EXECUTIVE INFORMATION		
VPM–2+	VERSION	PART NUMBER
VPM–A PROCESSOR	8.18	083026–818
VPM–B PROCESSOR	8.18	083026–818
VPM–C PROCESSOR	8.18	083026–818

IXC SETUP				
CROSSING TEST MODE	OFF			
FLASH RATE	55 FPM			
	IXC 1	IXC 2	IXC 3	IXC 4
VOLTAGE REGULATION	ON	ON		
L1 VOLTAGE	12.0V	12.0V		
L2 VOLTAGE	12.0V	12.0V		
GATE 1 DELAY	3 SEC	3 SEC		
GATE 2 DELAY	3 SEC	3 SEC		

APPLICATION SOFTWARE INFORMATION	
NAME	SR 524_14.3
REV.	XXXXX
CHECKSUM	TBD
CRC	TBD
CHASSIS ID	255
ID STRAPPING	IIIIIIII

NA = NOT APPLICABLE

XP4 CONFIGURATION PLAN

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

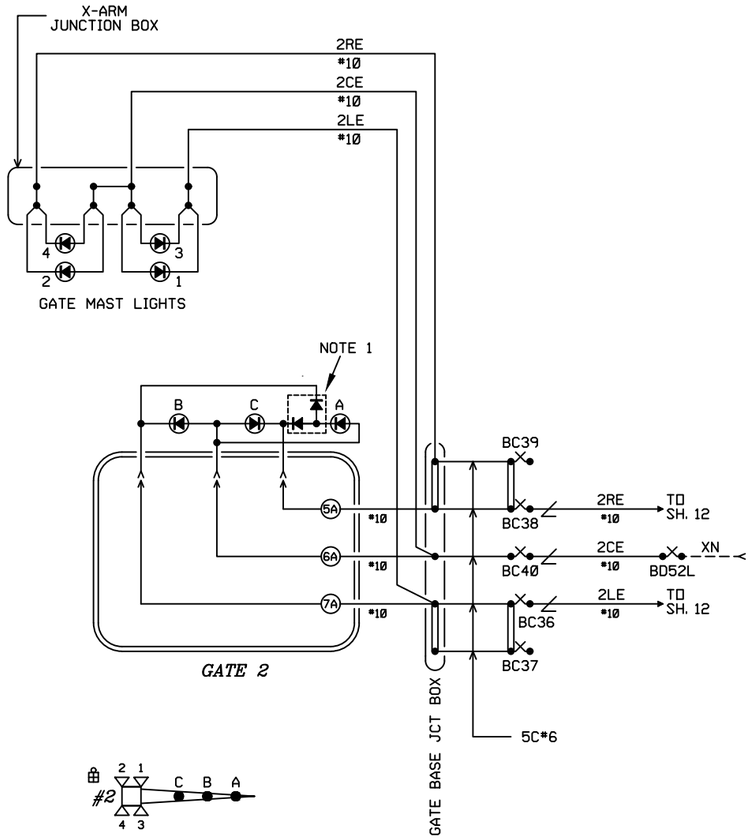
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

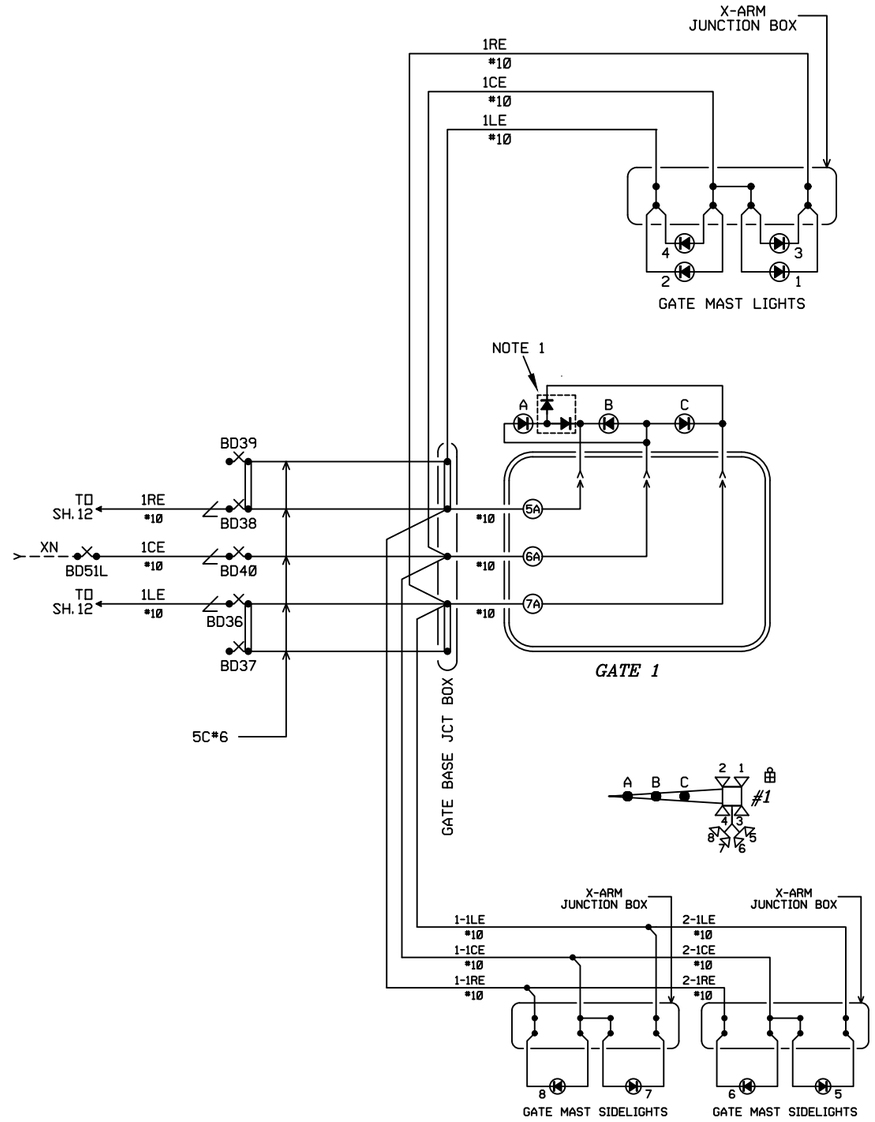
DATE *05/14/2019*

014

14 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-014.dwg





NOTES:
1. TIP DIODE KIT. GETS PN 227194-100.

GATE LIGHTING CIRCUITS

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

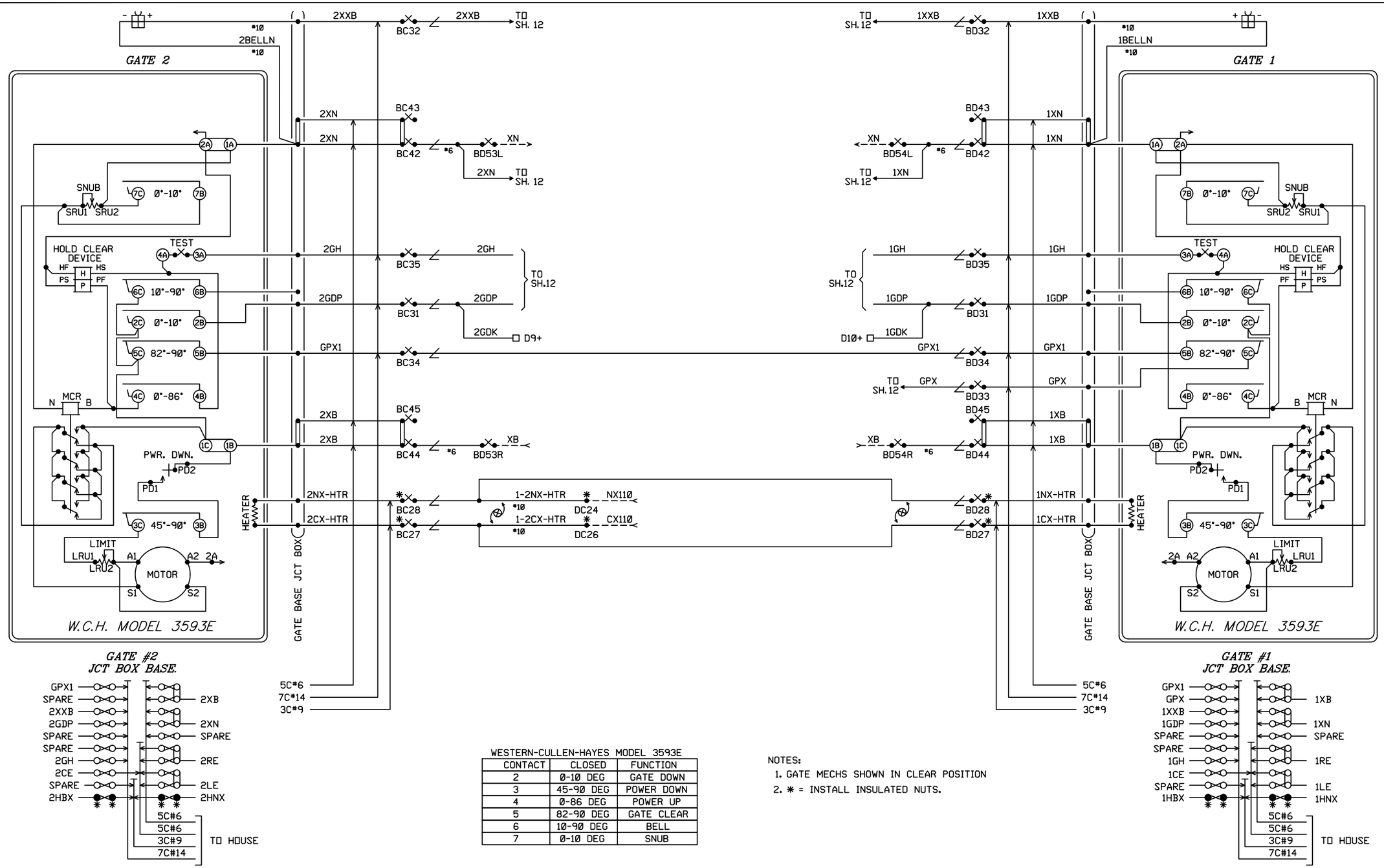
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE *05/14/2019*

015

15 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-015.dwg



GATE #2
JCT BOX BASE.

GPX1	
SPARE	2XB
2XXB	
2GDP	2XN
SPARE	SPARE
SPARE	
2GH	2RE
2CE	
SPARE	2LE
2HBX	2HNX
	5C#6
	5C#6
	3C#9
	7C#14

TO HOUSE

GATE #1
JCT BOX BASE.

GPX1	
GPX	1XB
1XXB	
1GDP	1XN
SPARE	SPARE
SPARE	
1GH	1RE
1CE	
SPARE	1LE
1HBX	1HNX
	5C#6
	5C#6
	3C#9
	7C#14

TO HOUSE

WESTERN-CULLEN-HAYES MODEL 3593E

CONTACT	CLOSED	FUNCTION
2	0-10 DEG	GATE DOWN
3	45-90 DEG	POWER DOWN
4	0-86 DEG	POWER UP
5	82-90 DEG	GATE CLEAR
6	10-90 DEG	BELL
7	0-10 DEG	SNUB

NOTES:
1. GATE MECHS SHOWN IN CLEAR POSITION
2. * = INSTALL INSULATED NUTS.

GATE MECHANISM CIRCUITS

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

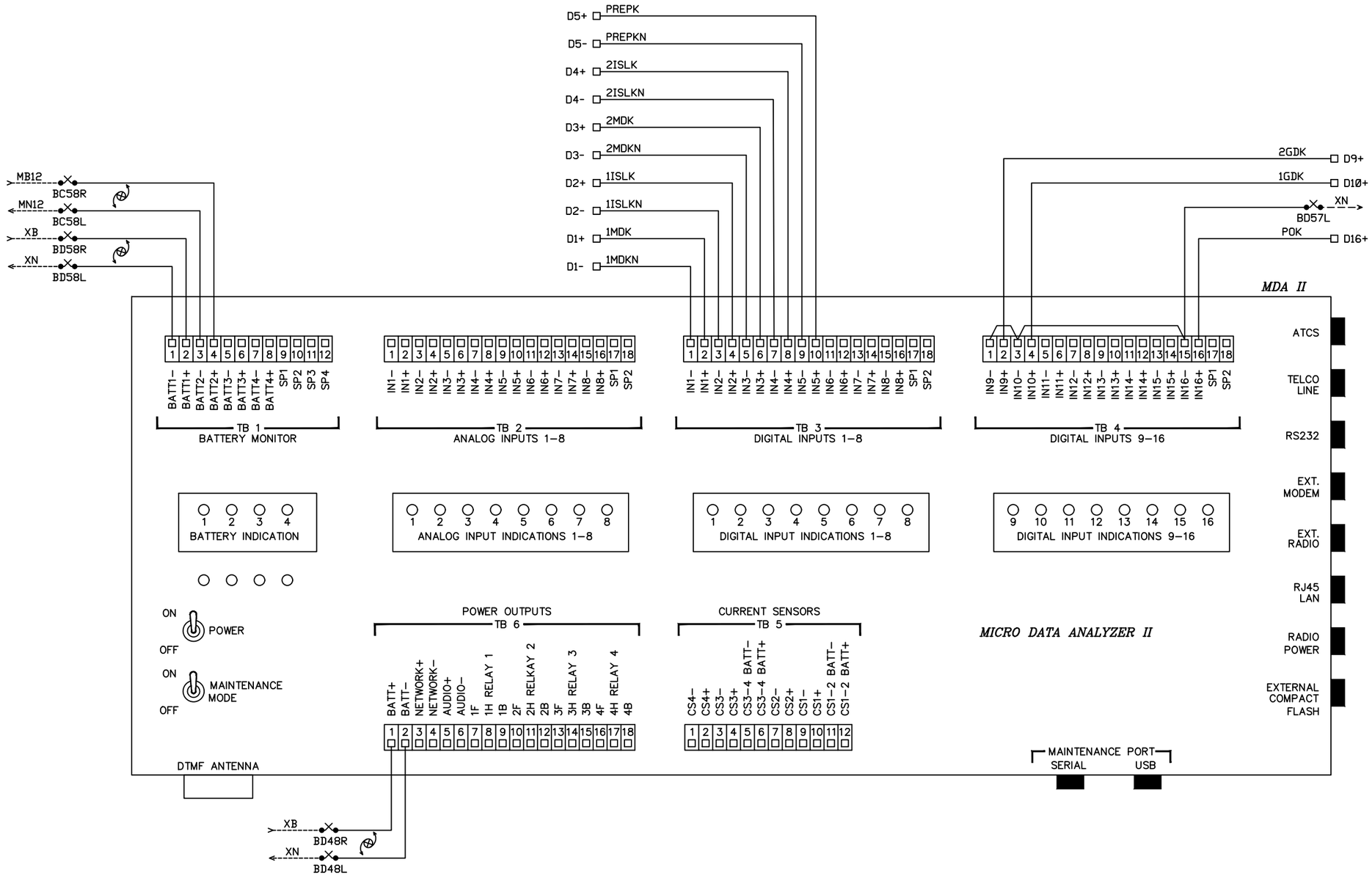
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

016

16 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-016.dwg



RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-017.dwg

EVENT RECORDER CIRCUITS

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

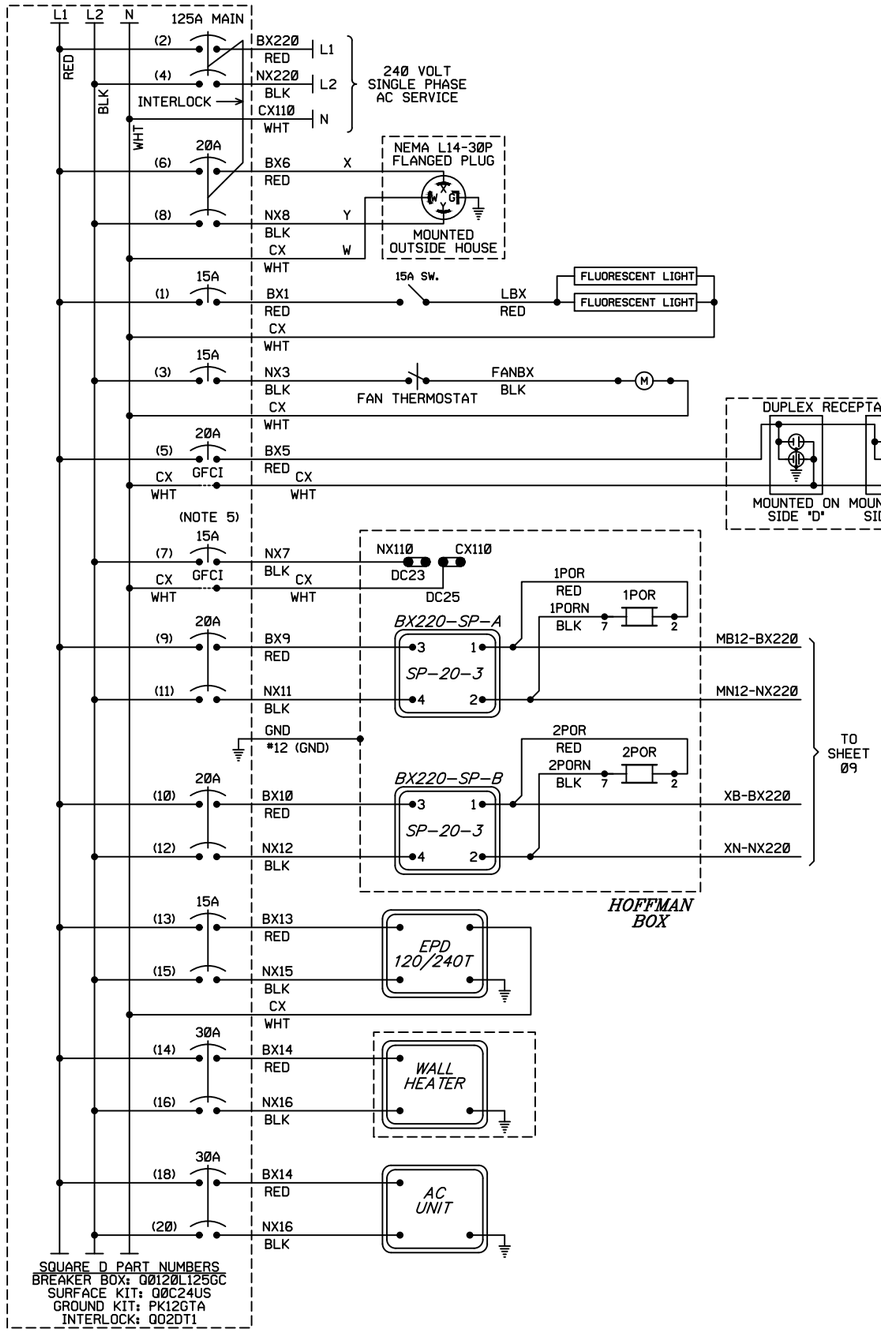
SR 524

RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

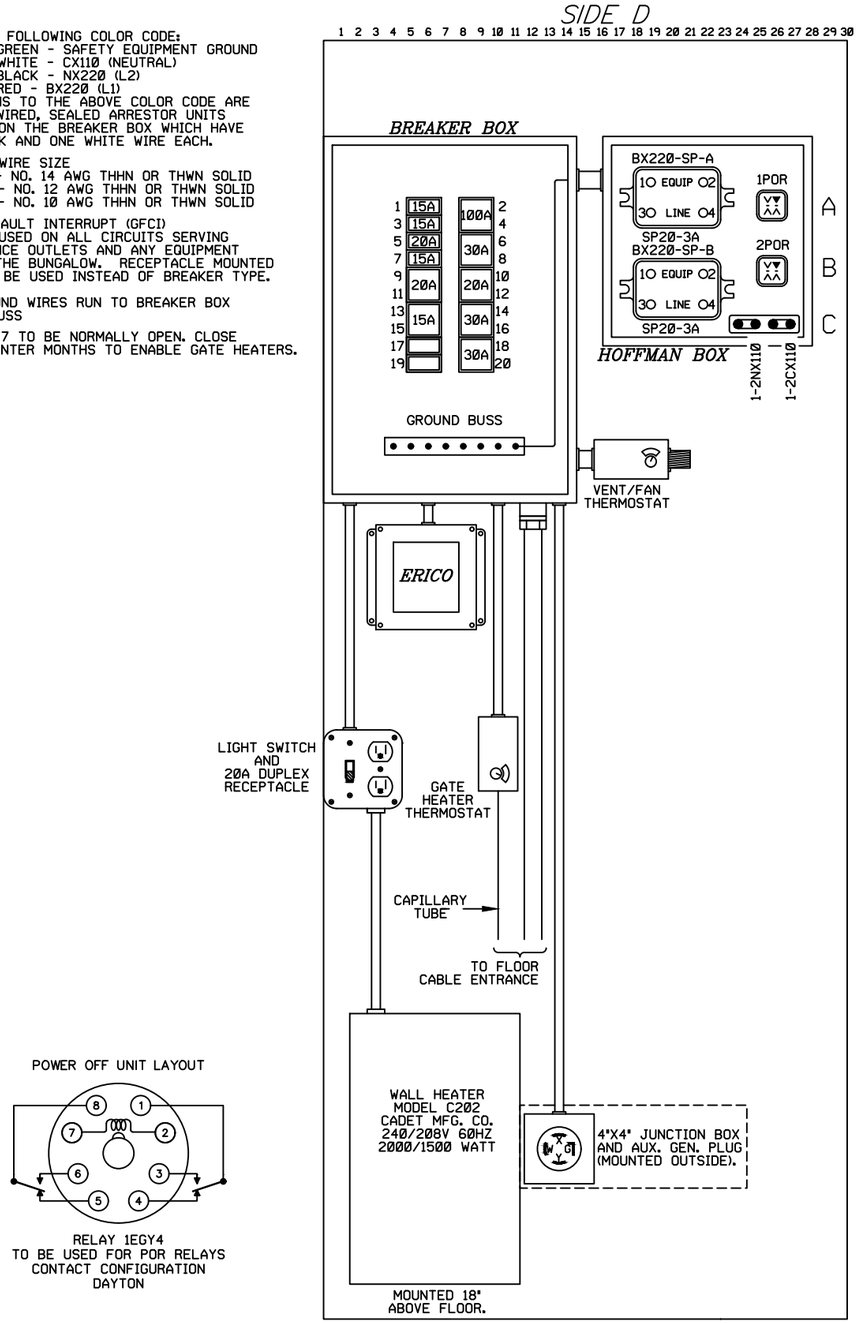
017

17 OF 22



NOTES:

1. USE THE FOLLOWING COLOR CODE:
   GRN - GREEN - SAFETY EQUIPMENT GROUND
   WHT - WHITE - CX110 (NEUTRAL)
   BLK - BLACK - NX220 (L2)
   RED - RED - BX220 (L1)
   EXCEPTIONS TO THE ABOVE COLOR CODE ARE THE PRE-WIRED, SEALED ARRESTOR UNITS MOUNTED ON THE BREAKER BOX WHICH HAVE TWO BLACK AND ONE WHITE WIRE EACH.
2. MINIMUM WIRE SIZE
   10 AMP - NO. 14 AWG THHN OR THWN SOLID
   20 AMP - NO. 12 AWG THHN OR THWN SOLID
   30 AMP - NO. 10 AWG THHN OR THWN SOLID
3. GROUND FAULT INTERRUPT (GFCI) MUST BE USED ON ALL CIRCUITS SERVING CONVENIENCE OUTLETS AND ANY EQUIPMENT OUTSIDE THE BUNGALOW. RECEPTACLE MOUNTED GFCI MAY BE USED INSTEAD OF BREAKER TYPE.
4. ALL GROUND WIRES RUN TO BREAKER BOX GROUND BUSS
5. BREAKER 7 TO BE NORMALLY OPEN. CLOSE DURING WINTER MONTHS TO ENABLE GATE HEATERS.



POWER OFF UNIT LAYOUT

RELAY 1EGY4
TO BE USED FOR POR RELAYS
CONTACT CONFIGURATION
DAYTON

AC POWER DISTRIBUTION

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

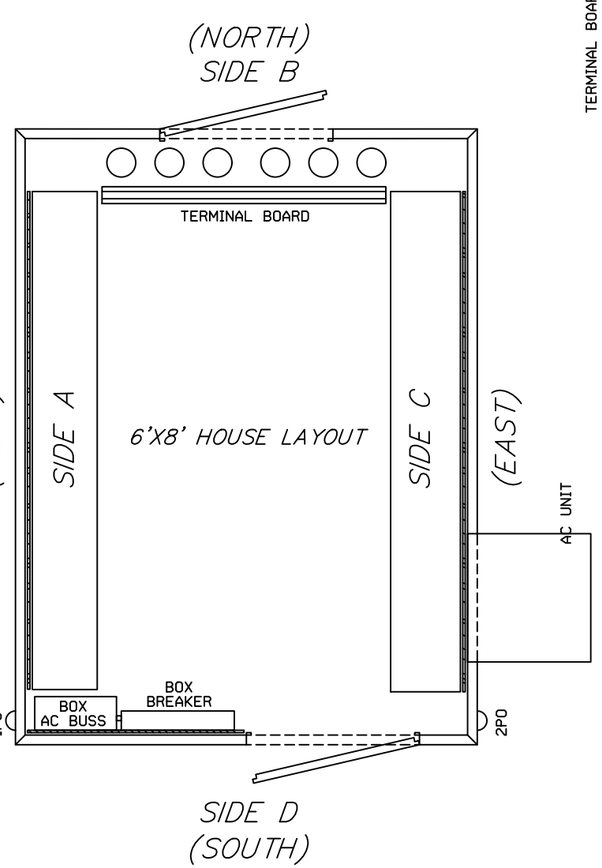
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

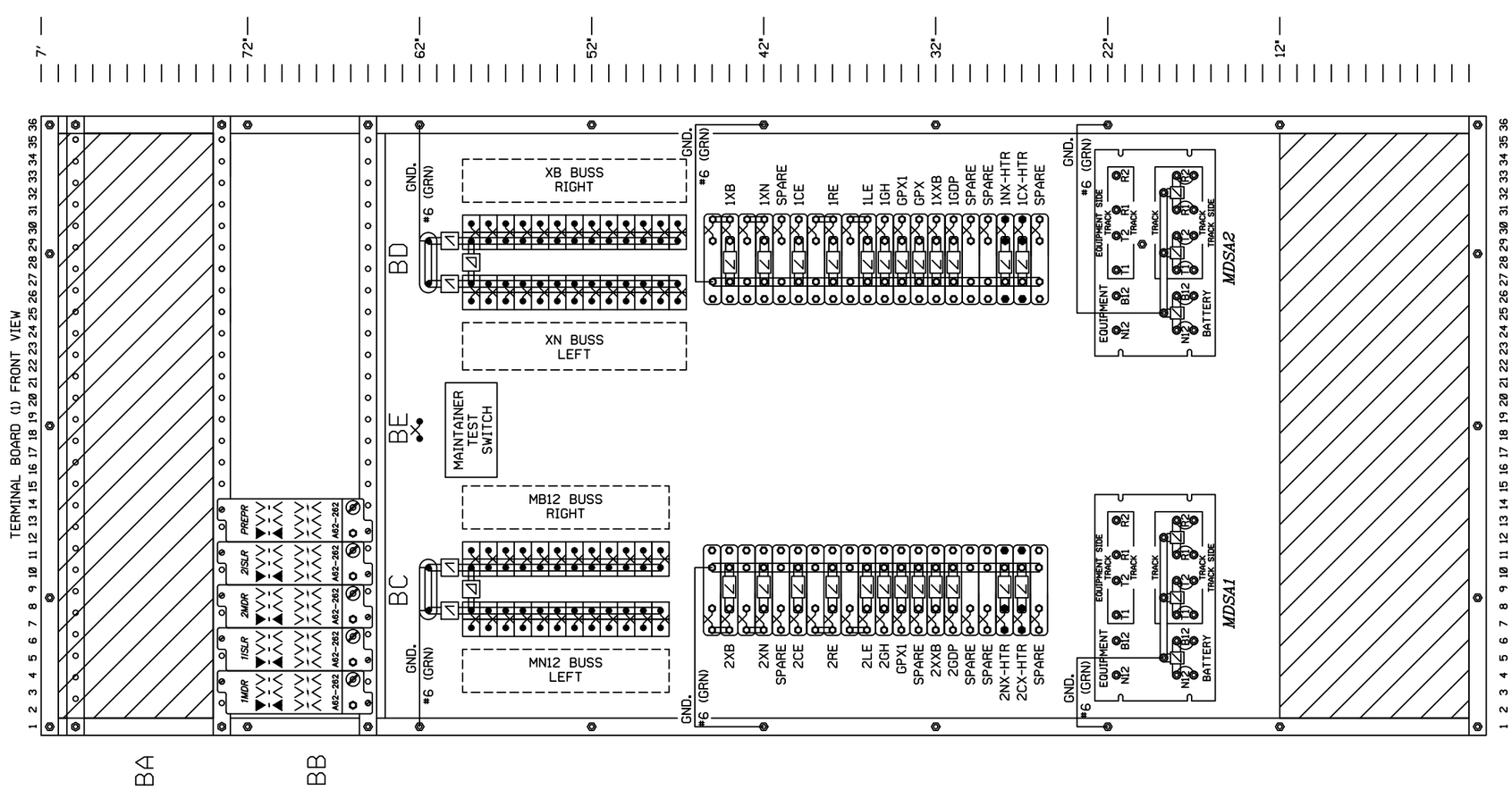
DATE 05/14/2019

018

18 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-018.dwg





MN12 BUSS LEFT		MB12 BUSS RIGHT
MB12 BATT(-)	59	MB12 BATT(+)
MDA II BATT2(-)	58	MDA II BATT2(+)
	57	
	56	
	55	
	54	
	53	
	52	
	51	
	50	
MDSA-1 BATT(-)	49	MDSA-1 BATT(+)
	48	

XN BUSS LEFT		XB BUSS RIGHT
XB BATT(-)	59	XB BATT(+)
MDA II BATT 1(-)	58	MDA II BATT1(+)
MDA II IN 16(-)	57	
XIP-20B GATE BATT-	56	XIP-20B GATE BATT+
	55	
BD42L	54	BD43L
BC42R	53	BC43R
2CE	52	
1CE	51	
	50	
IXC-20S (J5-2)	49	IXC-20S (BE62)
MDA II BATT(-)	48	MDA II BATT(+)
AA45	47	2POR 1

NOTE:

1. NO EQUIPMENT ALLOWED IN SHADED AREAS.
2. INSTALL INSULATED NUTS ON GATE HEATER TERMINALS.
3. 6'X8' HOUSE IS EQUIPPED WITH INTERNAL TELESCOPING METAL LEGS.
4. EMERGENCY NOTIFICATION SIGN (ENS) TO BE POSTED ON SOUTH SIDE OF HOUSE.

WALL "B" LAYOUT

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

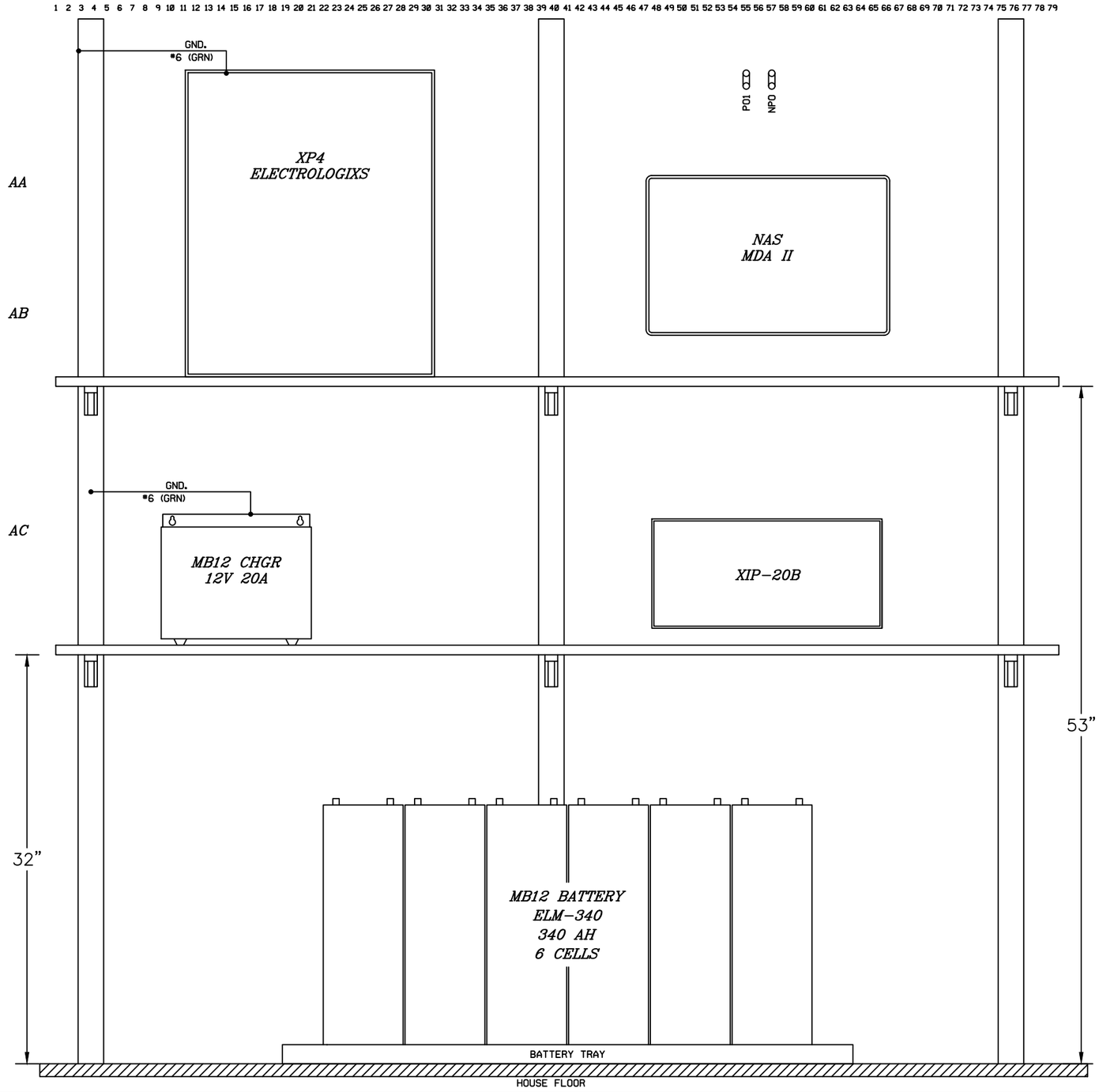
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

019

19 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-019.dwg



SIDE A

WALL "A" LAYOUT

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

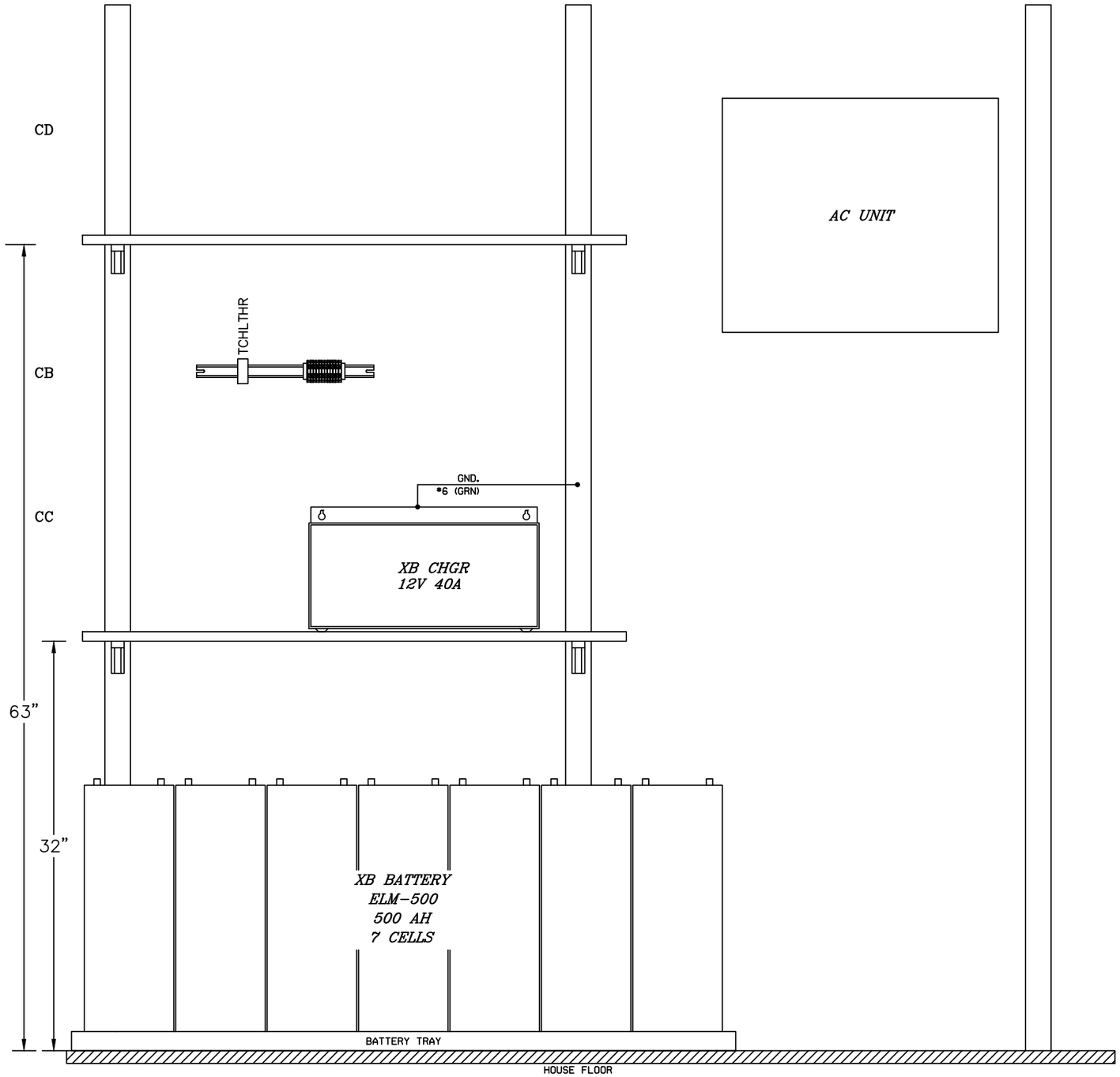
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

020

20 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-020.dwg



WALL "C" LAYOUT

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

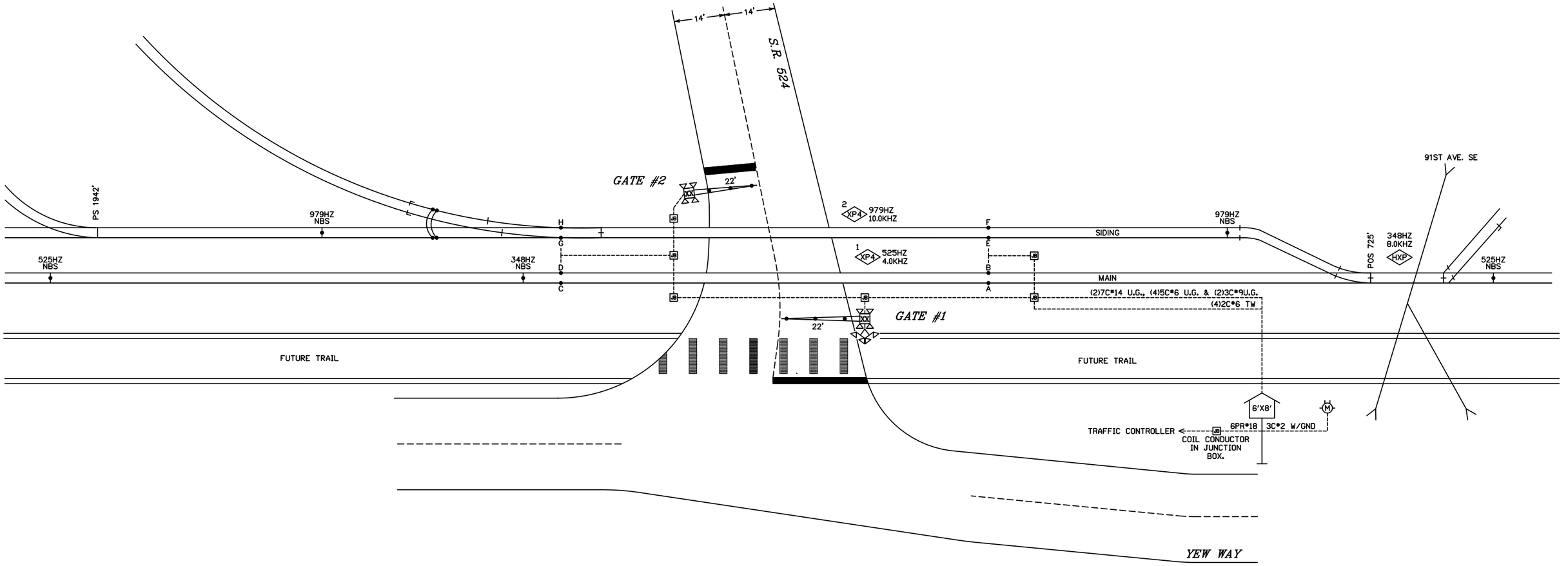
RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

021

21 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-021.dwg



CABLE PLAN

LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE AND MAY BE INCOMPLETE

REV.	DATE	DESCRIPTION	BY

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

RIO GRANDE PACIFIC TECHNOLOGY

SR 524

RAILROAD SIGNALING
BOTHELL, WASHINGTON
M.P. 14.3 DOT# 091 814T

DATE 05/14/2019

022

22 OF 22

RIOTECH BRAD FEWELL November 15, 2019 12:31 PM Z:\DEA\SR 524\SR524-022.dwg