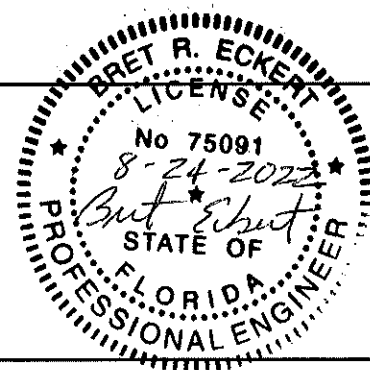


| SHEET NO.  | CONTENTS  |
|------------|---|
| 1          | General Notes   |
| 2          | QuadGuard® M10 24" to Thrie Beam Guardrail, Unidirectional          |
| 3          | QuadGuard® M10 24" to Single Slope Concrete Barrier, Unidirectional |
| 4          | QuadGuard® M10 24" to Vertical Concrete Barrier, Unidirectional     |
| 5          | QuadGuard® M10 24" to 31" W-Beam Guardrail, Bidirectional           |
| 6          | QuadGuard® M10 24" to Thrie Beam Guardrail, Bidirectional           |
| 7          | QuadGuard® M10 24" to Single Slope Concrete Barrier, Bidirectional  |
| 8          | QuadGuard® M10 24" to Vertical Concrete Barrier, Bidirectional      |
| 9          | QuadGuard® M10 24" to Safety Shape Concrete Barrier, Bidirectional  |
| 10, 11, 12 | QuadGuard® M10 24" Concrete Pad                                     |
| 13         | QuadGuard® II Conversion Concrete Pad 1 Bay Extension               |

**QUADGUARD® M10 SYSTEM TL-2 (Permanent)**  
**APL 544-002-003**

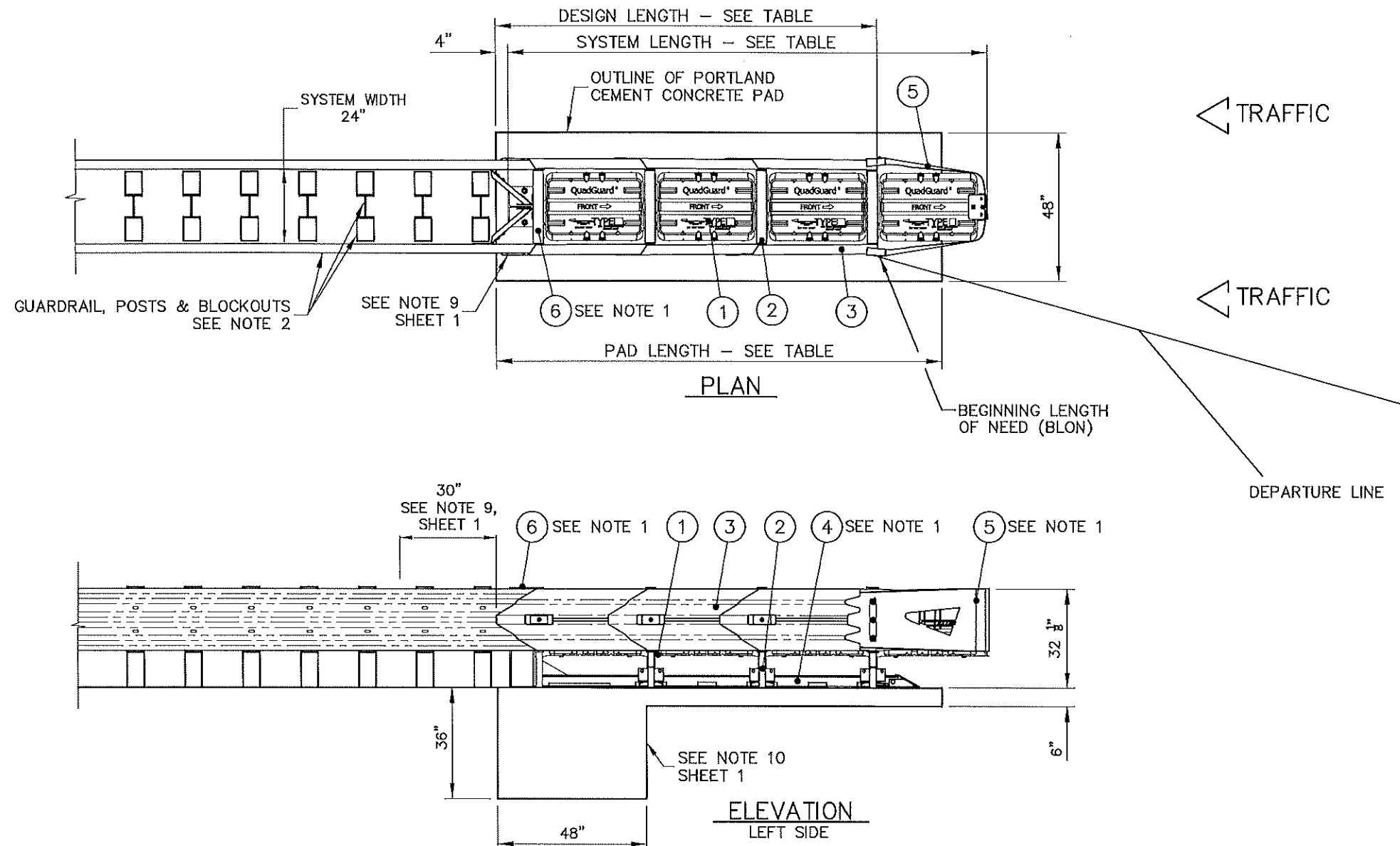
- The energy absorbing system represented on these Approved Products List (APL) drawings is a proprietary design by Energy Absorption Systems, of VALTIR, LLC, and marketed under the name QUADGUARD® M10 System (QGM10).
- The QGM10 is a redirective, non-gating crash cushion which is well suited for shielding hazards. The QGM10 is used for permanent installations. The beginning length of need shall be at the point of intersection between the face of the crash cushion and the departure line.
- The 3-bay QGM10 has been evaluated to MASH crash test criteria and is suitable for Test Level 2 crash cushion applications.
- The QGM10 shall be assembled and installed in accordance with the manufacturer's detailed drawings, procedures and specifications, product manual or installation guide. Information and copies of the above documents are available on the Approved Product List (APL).
- The QGM10 is available in 24" nominal width.
- Only the QGM10 Type I and Type II energy absorbing cartridges shall be used as shown on the drawings.
- All metallic compounds shall meet the galvanizing requirements for guardrail, FDOT Specification Section 967.
- Units of measurements are in English units.
- Ensure adequate space is provided for all rear fender panels to slide rearward 30" upon impact.
- QGM10 shall be placed on a min. 6" thick reinforced 4000 PSI Portland Cement concrete pad as detailed in the drawings. As an alternate, a min. 8" thick concrete, 4000 psi Portland Cement concrete roadway measuring at least 12'-0" wide by 50'-0" long. Existing concrete pads or new pads with below ground obstructions are acceptable with anchor blocks located at the front of the pad.
- See the QUADGUARD® M10 System Product manual for a description of its impact performance characteristics and design limitations before placing a system at a given site. Information and copies of current manual are available on the APL.
- For proper impact performance, the QGM10 system must be restored to its original length and condition after each impact.
- The QGM10 tension strut backup is the primary backup to be used on Florida Department of Transportation projects.



|  |                     |                           |                                     |                |     |
|--|---------------------|---------------------------|-------------------------------------|----------------|-----|
| DRAWN:<br>J. SIMMONS   | DATE:<br>04/09/2020 | MODEL:<br>N/A             | QUADGUARD® M10 24" TL-2 (PERMANENT) |                |     |
| CHECKED:<br>B. ECKERT  | DATE:<br>04/17/2020 | TRAFFIC DIRECTION:<br>N/A | APL 544-002-003                     |                |     |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH.<br>DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND QMS-SE-003<br>UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE<br>DRAWING   |                                     |                |     |
| REVISION DESCRIPTION   | ECO                 | DATE                      | REV                                 | BY             | CHK |
| UPDATED TABLE OF CONTENTS, UPDATED APL NUMBER  | 7204                | 06/05/20                  | A                                   | JMS            | BRE |
| RENUMBERED SHEETS, WAS SHEET 1 OF 12, ADDED 8" NON-REINFORCED CONCRETE OPTION  | 7427                | 05/27/21                  | B                                   | JMS            | BRE |
| BORDER WAS THP BORDER  | 8151                | 08/16/22                  | C                                   | RJV            | RCB |
| DRAWING: 60-45-47  |                     |                           | REV: C                              | SHEET: 1 of 13 |     |



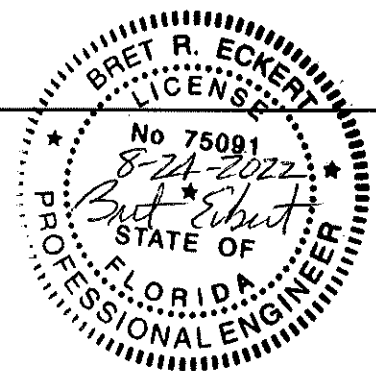
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- NOTES:
1. BACKUP, MONORAIL AND NOSE ASSEMBLIES NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
  2. GUARDRAIL, POSTS, BLOCKOUTS AND HARDWARE ARE STANDARD HIGHWAY ISSUE AND ARE NOT INCLUDED WITH QUADGUARD® M10 SYSTEM.
  3. GUARDRAIL TERMINATED BEHIND QUADGUARD® M10 FENDER PANELS.

| PERMANENT CRASH CUSHION DESIGN TABLE |           |               |               |            |              |            |                   |         |
|--------------------------------------|-----------|---------------|---------------|------------|--------------|------------|-------------------|---------|
| BAYS                                 | 24" WIDTH | SYSTEM LENGTH | DESIGN LENGTH | PAD LENGTH | DESIGN SPEED | TEST LEVEL | NO. OF CARTRIDGES |         |
|                                      | MODEL #   |               |               |            |              |            | TYPE I            | TYPE II |
| 3                                    | QM7024    | 13'-0"        | 10'-2"        | 12'-0"     | 43 mph       | TL-2       | 3                 | 1       |

NOTE: FOR LOW SPEED FACILITIES WITH A DESIGN SPEED OF ≤ 45 MPH USE A TL-2 SYSTEM.



| KEY                |                 |
|--------------------|-----------------|
| ① QG M10 CARTRIDGE | ④ MONORAIL      |
| ② DIAPHRAGM        | ⑤ NOSE ASSEMBLY |
| ③ FENDER PANEL     | ⑥ BACKUP        |

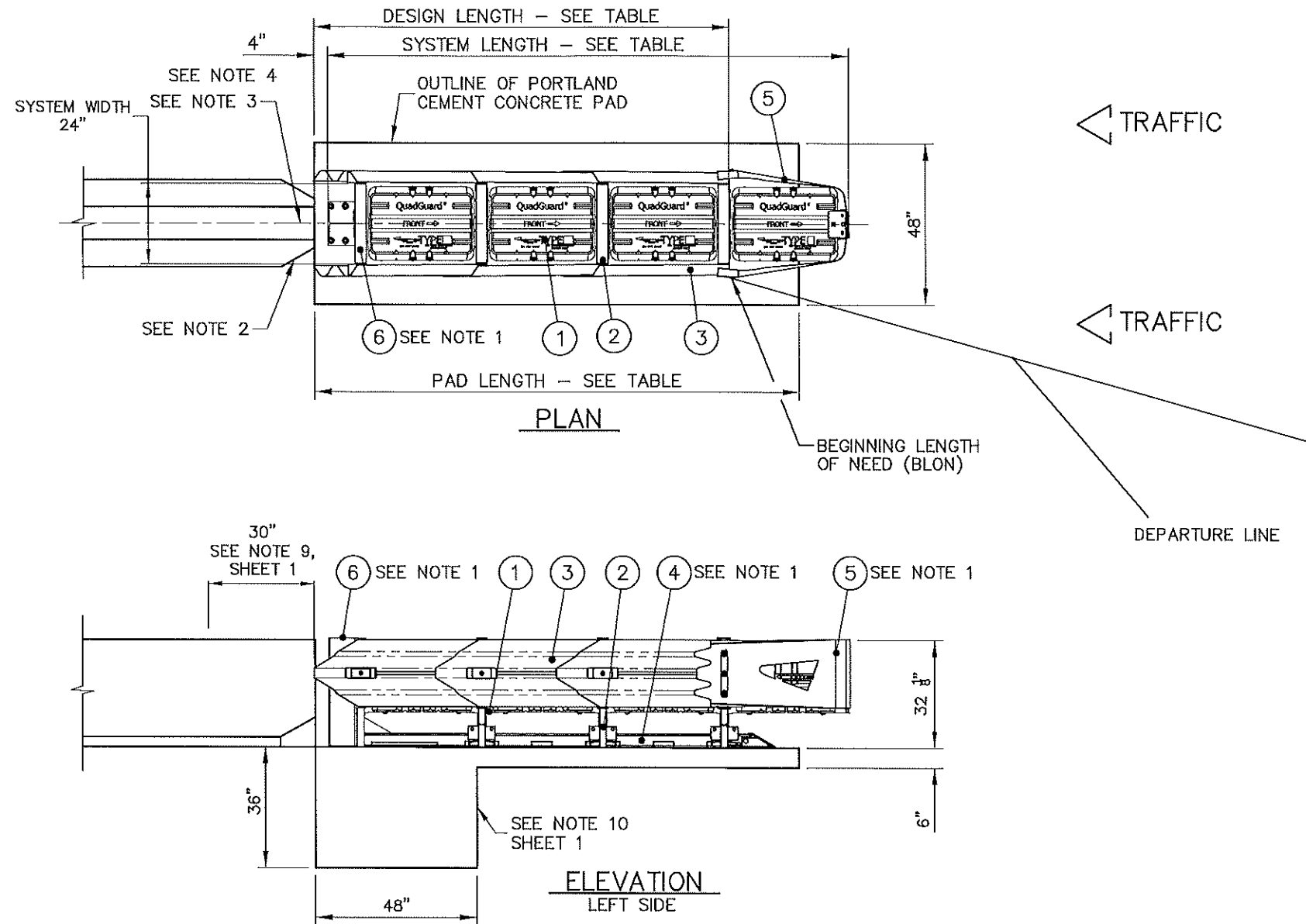
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|--|------------------|-----------------------------------|
| DRAWN: J. SIMMONS  | DATE: 04/09/2020 | MODEL: SEE TABLE                  |
| CHECKED: B. ECKERT   | DATE: 04/17/2020 | TRAFFIC DIRECTION: UNIDIRECTIONAL |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH. DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND QMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                  | DO NOT SCALE DRAWING              |
| REVISION DESCRIPTION   | ECO              | DATE                              |
| UPDATED APL NUMBER   | 7204             | 06/05/20                          |
| WAS SHEET 2 OF 12  | 7427             | 05/27/21                          |
| BORDER WAS THP BORDER  | 8151             | 08/16/22                          |

QUADGUARD® M10 24" TL-2 (PERMANENT) TO THRIE-BEAM GUARDRAIL  
 APL 544-002-003  
 FLORIDA  
 DRAWING: 60-45-47  
 REV: C  
 SHEET: 2 of 13



VALTIR

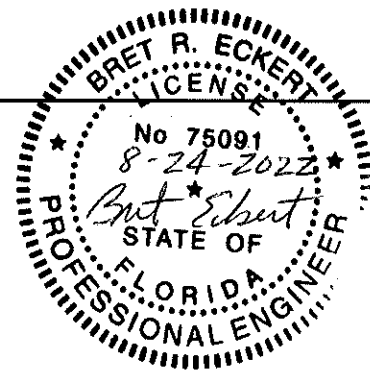
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- NOTES:
1. BACKUP, MONORAIL AND NOSE ASSEMBLIES NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
  2. CHAMFER ENDS OF BARRIER AT 15 DEGREES, TAPER (1:4).
  3. CAUTION:  $\phi$  OF QUADGUARD® M10 SYSTEM SHALL BE PARALLEL TO  $\phi$  OF BARRIER  $\pm 1'$ .
  4. CAUTION: MAX. 4" CLEARANCE BETWEEN BACKUP AND END OF BARRIER.

| PERMANENT CRASH CUSHION DESIGN TABLE |           |               |               |            |              |            |                   |         |
|--------------------------------------|-----------|---------------|---------------|------------|--------------|------------|-------------------|---------|
| BAYS                                 | 24" WIDTH | SYSTEM LENGTH | DESIGN LENGTH | PAD LENGTH | DESIGN SPEED | TEST LEVEL | NO. OF CARTRIDGES |         |
|                                      | MODEL #   |               |               |            |              |            | TYPE I            | TYPE II |
| 3                                    | QM7024    | 13'-0"        | 10'-2"        | 12'-0"     | 43 mph       | TL-2       | 3                 | 1       |

NOTE: FOR LOW SPEED FACILITIES WITH A DESIGN SPEED OF  $\leq 45$  MPH USE A TL-2 SYSTEM.



| KEY                |                 |
|--------------------|-----------------|
| ① QG M10 CARTRIDGE | ④ MONORAIL      |
| ② DIAPHRAGM        | ⑤ NOSE ASSEMBLY |
| ③ FENDER PANEL     | ⑥ BACKUP        |

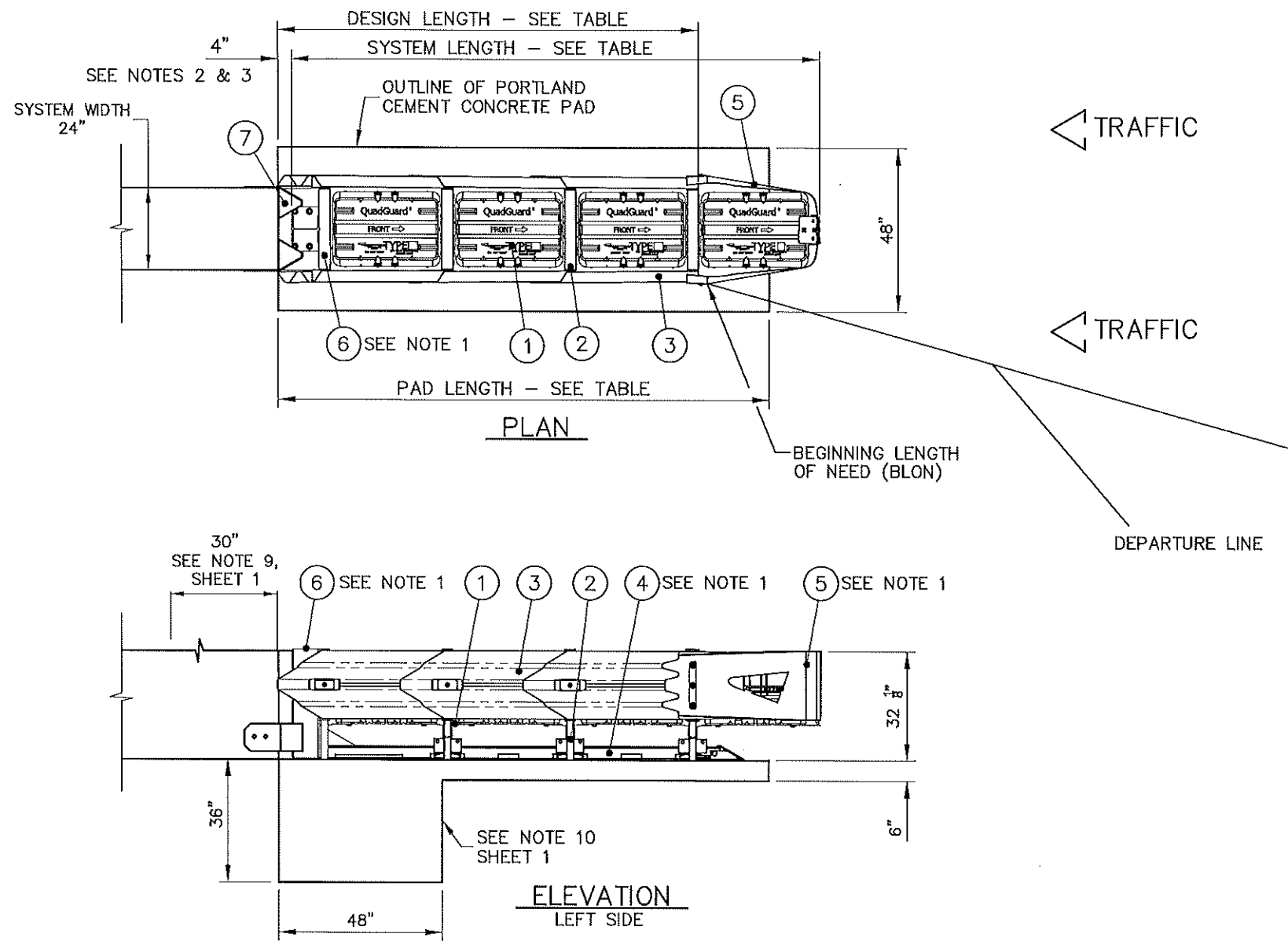
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| DRAWN: J. SIMMONS  | DATE: 04/09/2020 | MODEL: SEE TABLE                  |
| CHECKED: B. ECKERT   | DATE: 04/17/2020 | TRAFFIC DIRECTION: UNIDIRECTIONAL |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH. DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND QMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                  | DO NOT SCALE DRAWING              |
| REVISION DESCRIPTION   | ECO              | DATE                              |
| UPDATED APL NUMBER   | 7204             | 06/05/20                          |
| WAS SHEET 3 OF 12  | 7427             | 05/27/21                          |
| BORDER WAS THP BORDER  | 8151             | 08/17/22                          |

|   |
|---|
| QUADGUARD® M10 24" TL-2 (PERMANENT) TO CONCRETE BARRIER |
| APL 544-002-003   |
| FLORIDA   |
| DRAWING: 60-45-47                                       |



FLORIDA  
REV: C  
SHEET: 3 of 13

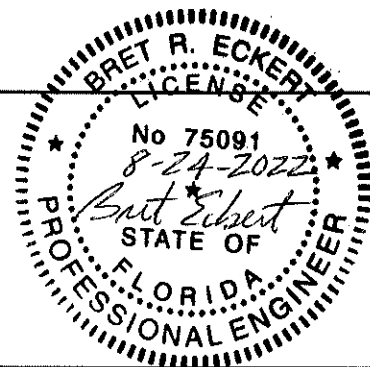
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- NOTES:
1. BACKUP, WHEEL DEFLECTORS, MONORAIL AND NOSE ASSEMBLIES NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY. WHEEL DEFLECTORS ARE ACCESSORY ITEMS.
  2. WHEEL DEFLECTORS MAY BE USED ON EITHER SIDE OR BOTH FOR UNIDIRECTIONAL APPLICATIONS AS NEEDED.
  3. CAUTION: MAX. 4" CLEARANCE BETWEEN BACKUP AND WALL

| PERMANENT CRASH CUSHION DESIGN TABLE |           |               |               |            |              |            |                   |         |
|--------------------------------------|-----------|---------------|---------------|------------|--------------|------------|-------------------|---------|
| BAYS                                 | 24" WIDTH | SYSTEM LENGTH | DESIGN LENGTH | PAD LENGTH | DESIGN SPEED | TEST LEVEL | NO. OF CARTRIDGES |         |
|                                      | MODEL #   |               |               |            |              |            | TYPE I            | TYPE II |
| 3                                    | QM7024    | 13'-0"        | 10'-2"        | 12'-0"     | 43 mph       | TL-2       | 3                 | 1       |

NOTE: FOR LOW SPEED FACILITIES WITH A DESIGN SPEED OF ≤ 45 MPH USE A TL-2 SYSTEM.



| KEY                |                   |
|--------------------|-------------------|
| ① QG M10 CARTRIDGE | ⑦ WHEEL DEFLECTOR |
| ② DIAPHRAGM        |                   |
| ③ FENDER PANEL     |                   |
| ④ MONORAIL         |                   |
| ⑤ NOSE ASSY        |                   |
| ⑥ BACKUP           |                   |

|  |                     |                                      |
|--|---------------------|--------------------------------------|
| DRAWN:<br>J. SIMMONS   | DATE:<br>04/09/2020 | MODEL:<br>SEE TABLE                  |
| CHECKED:<br>B. ECKERT  | DATE:<br>04/17/2020 | TRAFFIC DIRECTION:<br>UNIDIRECTIONAL |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH, DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND QMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE DRAWING                 |
| REVISION DESCRIPTION   | ECO                 | DATE                                 |
| UPDATED APL NUMBER   | 7204                | 06/05/20                             |
| WAS SHEET 4 OF 12  | 7427                | 05/27/21                             |
| BORDER WAS THP BORDER  | 8151                | 08/17/22                             |

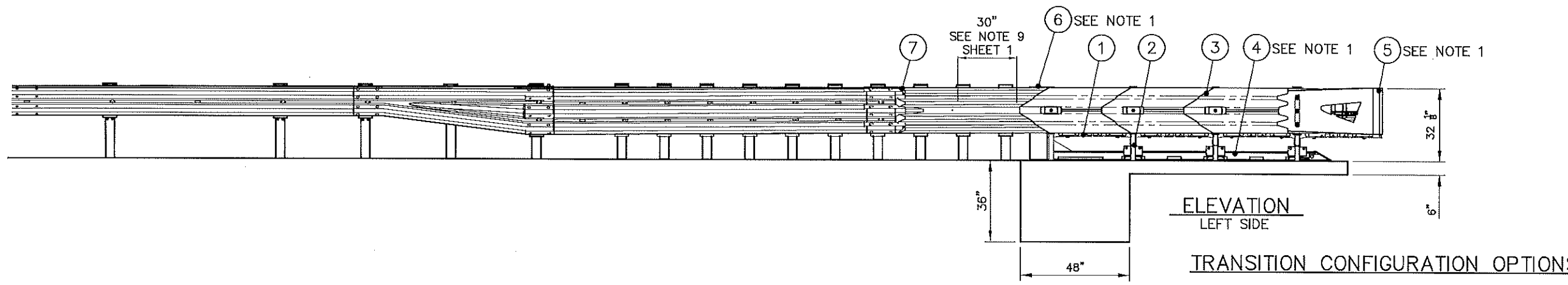
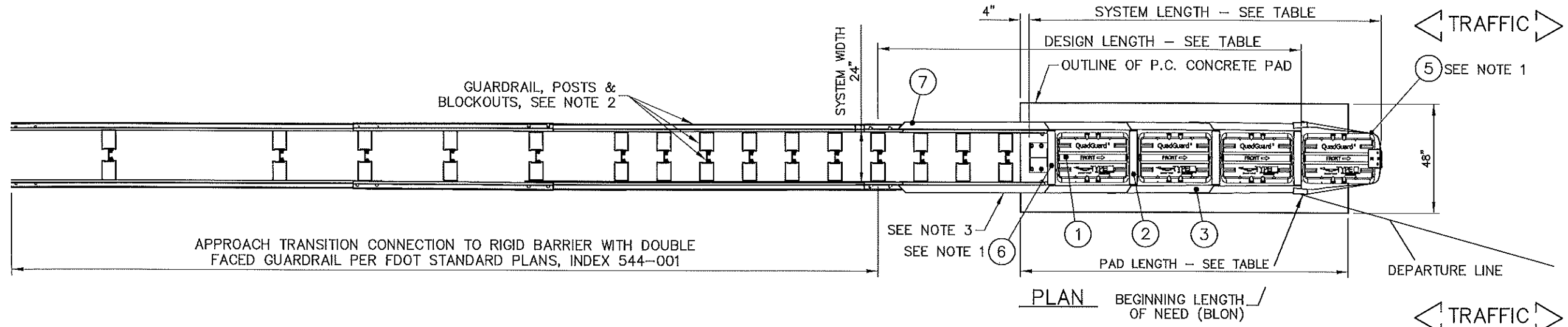
|   |
|---|
| QUADGUARD® M10 24" TL-2 (PERMANENT)<br>TO VERTICAL CONCRETE BARRIER |
| APL 544-002-003   |
| FLORIDA   |
| DRAWING: 60-45-47   |
| REV: C  |



FLORIDA  
SHEET: 4 of 13

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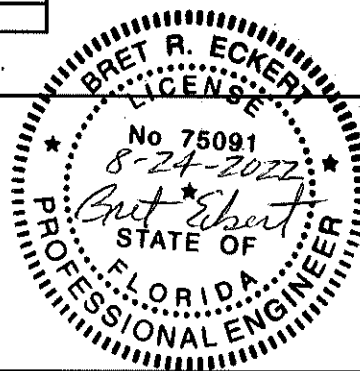
QMS-FE-048 Rev 0, (06/01/2022)



- NOTES:
1. BACKUP, MONORAIL, TRANSITION PANEL AND NOSE ASSEMBLIES NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
  2. GUARDRAIL, POSTS, BLOCKS AND HARDWARE ARE STANDARD HIGHWAY ISSUE AND ARE NOT INCLUDED WITH QUADGUARD® M10 SYSTEM.
  3. TRANSITION PANEL SHALL BE ANGLED SUCH THAT MAXIMUM GAP FROM FENDER PANEL OVERLAP DOES NOT EXCEED .78\".

| PERMANENT CRASH CUSHION DESIGN TABLE |                      |                  |                  |               |                 |               |                   |         |
|--------------------------------------|----------------------|------------------|------------------|---------------|-----------------|---------------|-------------------|---------|
| BAYS                                 | 24" WIDTH<br>MODEL # | SYSTEM<br>LENGTH | DESIGN<br>LENGTH | PAD<br>LENGTH | DESIGN<br>SPEED | TEST<br>LEVEL | NO. OF CARTRIDGES |         |
|                                      |                      |                  |                  |               |                 |               | TYPE I            | TYPE II |
| 3                                    | QM7024               | 13'-0"           | 15'-6"           | 12'-0"        | 43 mph          | TL-2          | 4                 | 3       |

NOTE: FOR LOW SPEED FACILITIES WITH A DESIGN SPEED OF ≤ 43 MPH USE A TL-2 SYSTEM.



| KEY                |                    |
|--------------------|--------------------|
| ① QG M10 CARTRIDGE | ⑦ TRANSITION PANEL |
| ② DIAPHRAGM        |                    |
| ③ FENDER PANEL     |                    |
| ④ MONORAIL         |                    |
| ⑤ NOSE ASSEMBLY    |                    |
| ⑥ BACKUP           |                    |

|  |                     |                                     |
|--|---------------------|-------------------------------------|
| DRAWN:<br>J. SIMMONS   | DATE:<br>04/09/2020 | MODEL:<br>SEE TABLE                 |
| CHECKED:<br>B. ECKERT  | DATE:<br>04/17/2020 | TRAFFIC DIRECTION:<br>BIDIRECTIONAL |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH. DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND OMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE DRAWING                |
| REVISION DESCRIPTION   | ECO                 | DATE                                |
| UPDATED APL NUMBER, DESIGN LENGTH, AND TABLE   | 7204                | 06/05/20                            |
| WAS SHEET 7  | 7427                | 05/27/21                            |
| BORDER WAS THP BORDER  | 8151                | 08/17/22                            |
|  | REV                 | BY                                  |
|  | A                   | JMS                                 |
|  | B                   | JMS                                 |
|  | C                   | RJV                                 |
|  | CHK                 | CHK                                 |
|  | BRE                 | BRE                                 |
|  | BRE                 | RCB                                 |

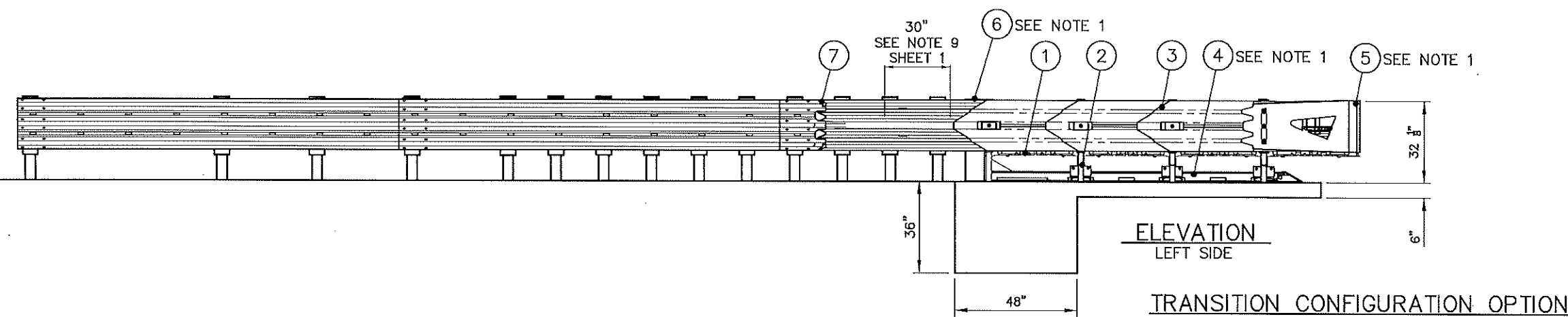
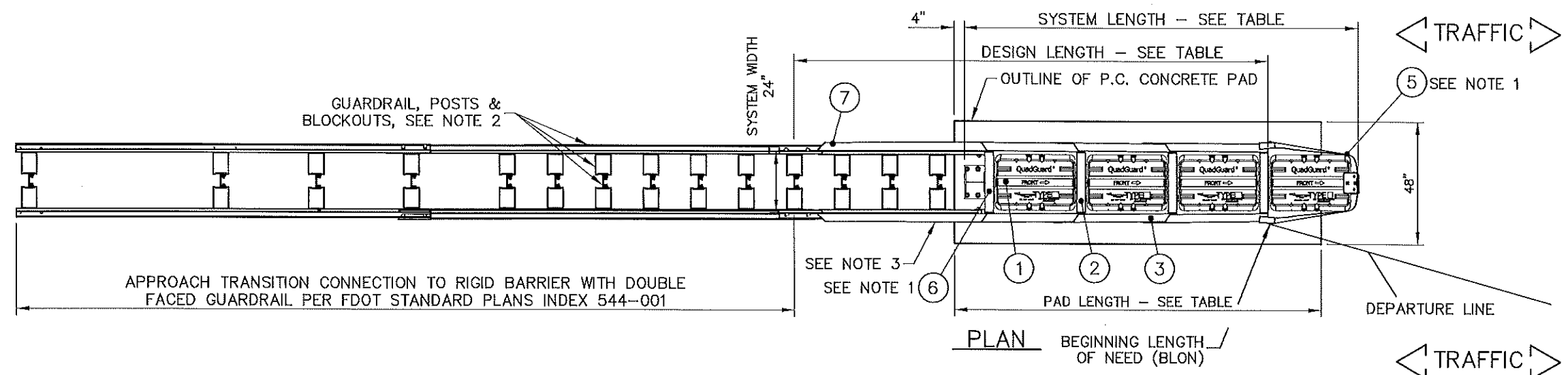
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|--|
| QUADGUARD® M10 24" TL-2 (PERMANENT)<br>TO 31" W-BEAM GUARDRAIL |
| APL 544-002-003  |
| FLORIDA  |
| DRAWING: 60-45-47  |
| REV: C   |



FLORIDA  
SHEET: 5 of 13

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OMS-FE-048 Rev 0, (06/01/2022)

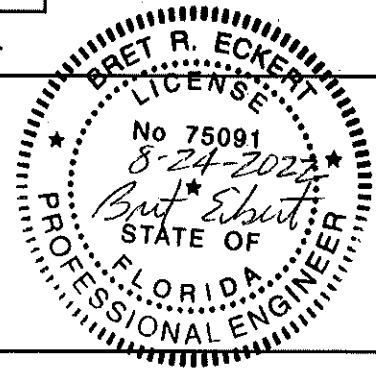


- NOTES:
1. BACKUP, MONORAIL, TRANSITION PANEL AND NOSE ASSEMBLIES NOT INCLUDED IN MODEL NUMBER. ORDER SEPARATELY.
  2. GUARDRAIL, POSTS, BLOCKS AND HARDWARE ARE STANDARD HIGHWAY ISSUE AND ARE NOT INCLUDED WITH QUADGUARD® M10 SYSTEM.
  3. TRANSITION PANEL SHALL BE ANGLED SUCH THAT MAXIMUM GAP FROM FENDER PANEL OVERLAP DOES NOT EXCEED .78\".

| PERMANENT CRASH CUSHION DESIGN TABLE |                      |                  |                  |               |                 |               |                   |         |
|--------------------------------------|----------------------|------------------|------------------|---------------|-----------------|---------------|-------------------|---------|
| BAYS                                 | 24" WIDTH<br>MODEL # | SYSTEM<br>LENGTH | DESIGN<br>LENGTH | PAD<br>LENGTH | DESIGN<br>SPEED | TEST<br>LEVEL | NO. OF CARTRIDGES |         |
|                                      |                      |                  |                  |               |                 |               | TYPE I            | TYPE II |
| 3                                    | QM7024               | 13'-0"           | 15'-6"           | 12'-0"        | 43 mph          | TL-2          | 4                 | 3       |

NOTE: FOR LOW SPEED FACILITIES WITH A DESIGN SPEED OF ≤ 43 MPH USE A TL-2 SYSTEM.

| KEY                |                    |
|--------------------|--------------------|
| ① QG M10 CARTRIDGE | ⑦ TRANSITION PANEL |
| ② DIAPHRAGM        |                    |
| ③ FENDER PANEL     |                    |
| ④ MONORAIL         |                    |
| ⑤ NOSE ASSEMBLY    |                    |
| ⑥ BACKUP           |                    |



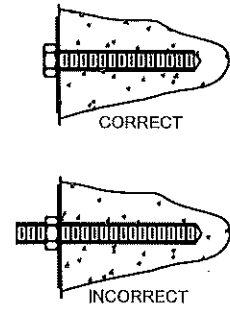
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|--|---------------------|-------------------------------------|
| DRAWN:<br>J. SIMMONS   | DATE:<br>06/05/2020 | MODEL:<br>SEE TABLE                 |
| CHECKED:<br>B. ECKERT  | DATE:<br>06/16/2020 | TRAFFIC DIRECTION:<br>BIDIRECTIONAL |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH.<br>DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND OMS-SE-003<br>UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE<br>DRAWING             |
| REVISION DESCRIPTION   | ECO                 | DATE                                |
| ADDED THIS SHEET   | 7204                | 06/05/20                            |
| WAS SHEET 8  | 7427                | 05/27/21                            |
| BORDER WAS THP BORDER  | 8151                | 08/17/22                            |

|  |                |
|--|----------------|
| QUADGUARD® M10 24" TL-2 (PERMANENT)<br>TO THRIE-BEAM GUARDRAIL |                |
| APL 544-002-003  |                |
| FLORIDA  | REV: C         |
| DRAWING: 60-45-47  | SHEET: 6 of 13 |

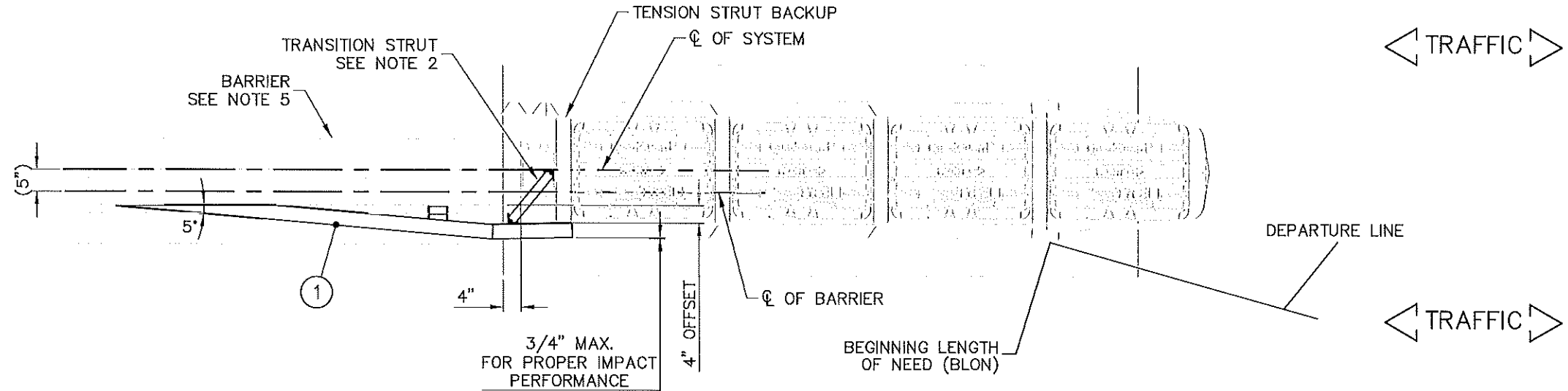


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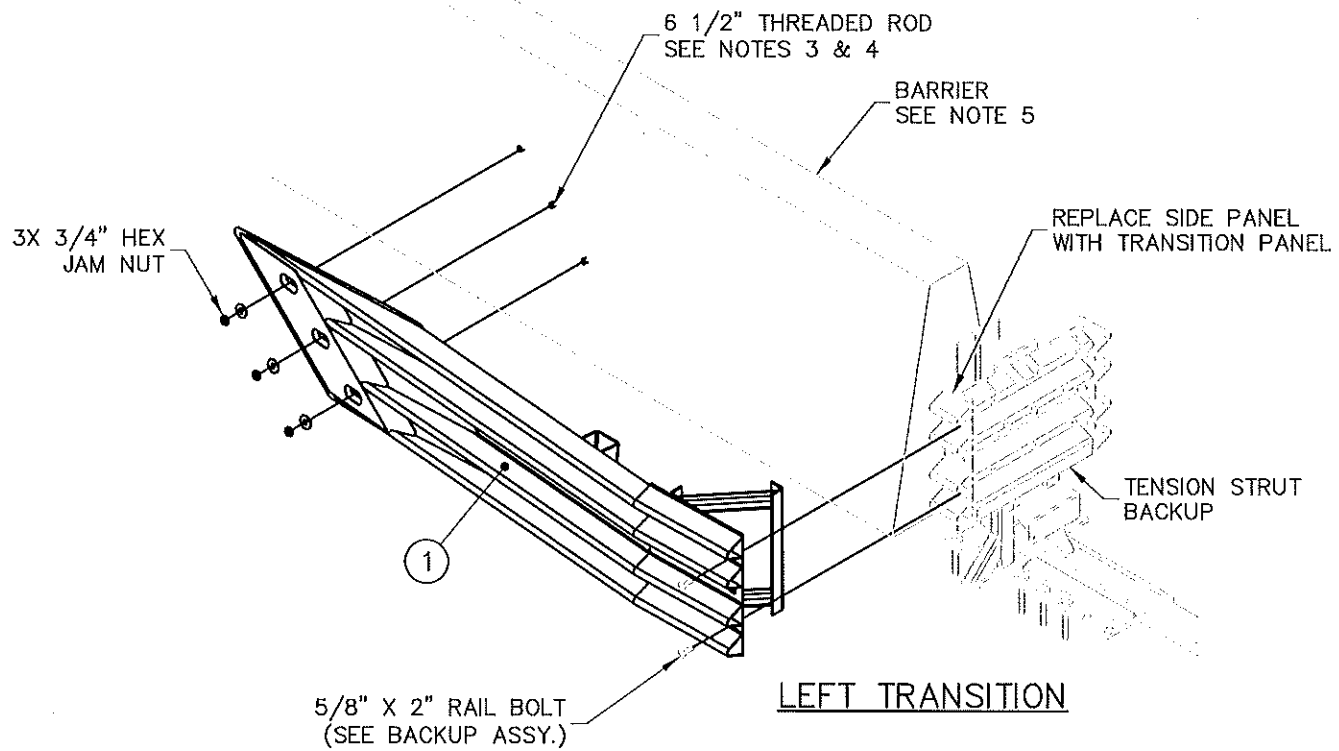
QVS-FE-048 Rev 0, (05/01/2022)



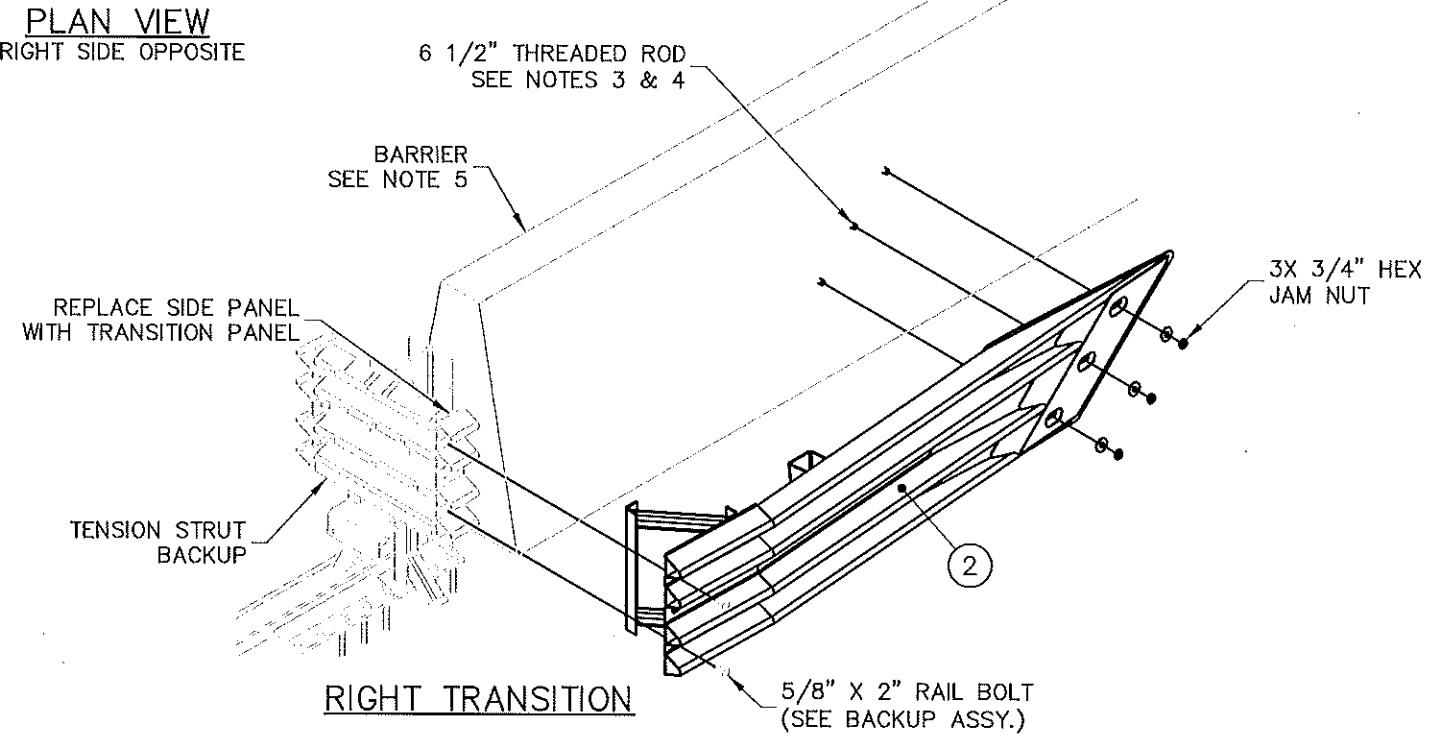
DETAIL B



PLAN VIEW  
RIGHT SIDE OPPOSITE



LEFT TRANSITION

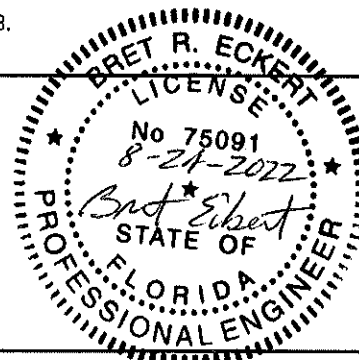


RIGHT TRANSITION

- NOTES:
1. IMPACT FORCES COULD BE TRANSFERRED INTO TERMINAL END OF THE BARRIER. ADEQUATE ANCHORAGE IS REQUIRED FOR PROPER IMPACT PERFORMANCE.
  2. POSITION TRANSITION STRUT TO CONTACT (1/4" GAP ACCEPTABLE) WIDE FLANGE BEAM OF BACKUP BEFORE ATTACHING TO BACKUP AND ANCHORING TO BARRIER.
  3. USE TRANSITION PANEL AS TEMPLATE FOR DRILLING. ENSURE FLUSH FIT TO BARRIER. RECOMMENDED HOLE DEPTH 5. FINAL TORQUE TO BE 100 FT-LBS (TYP).
  4. ANCHOR STUD END SHOULD BE FLUSH WITH OUTSIDE SURFACE OF ANCHOR NUT, SEE DETAIL B.
  5. STATE APPROVED SINGLE SLOPE CONCRETE BARRIER. SEE SHEET 9

KEY

- ① TRANSITION ASSY, 6 IN, SINGLE SLOPE, L
- ② TRANSITION ASSY, 6 IN, SINGLE SLOPE, R



|  |                     |                                     |
|--|---------------------|-------------------------------------|
| DRAWN:<br>J. SIMMONS   | DATE:<br>04/09/2020 | MODEL:<br>SEE TABLE                 |
| CHECKED:<br>B. ECKERT  | DATE:<br>04/17/2020 | TRAFFIC DIRECTION:<br>BIDIRECTIONAL |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH, DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND QMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE DRAWING                |
| REVISION DESCRIPTION   | ECO                 | DATE                                |
| UPDATED APL NUMBER AND DEPARTURE LINE  | 7204                | 06/05/20                            |
| WAS SHEET 9  | 7427                | 05/27/21                            |
| BORDER WAS THP BORDER  | 8151                | 08/17/22                            |
| REV  | BY                  | CHK                                 |
| A  | JMS                 | BRE                                 |
| B  | JMS                 | BRE                                 |
| C  | RJV                 | RCB                                 |

QUADGUARD® M10 24" TL-2 (PERMANENT)  
TO SINGLE SLOPE CONCRETE BARRIER

APL 544-002-003

FLORIDA

60-45-47

REV: C

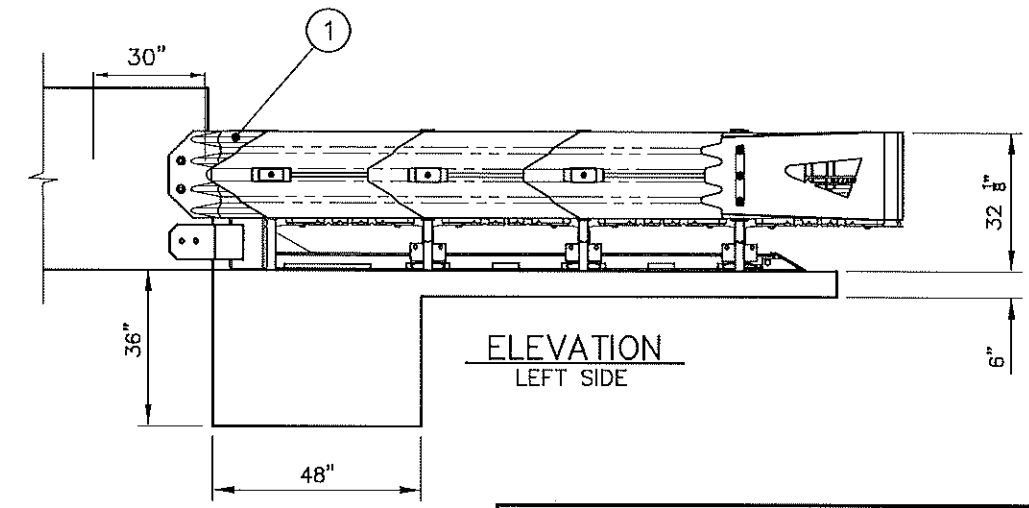
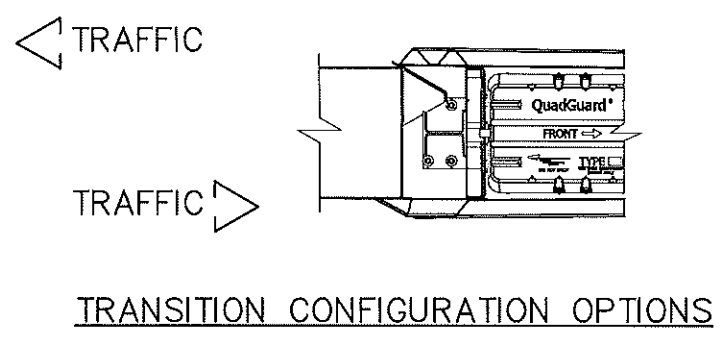
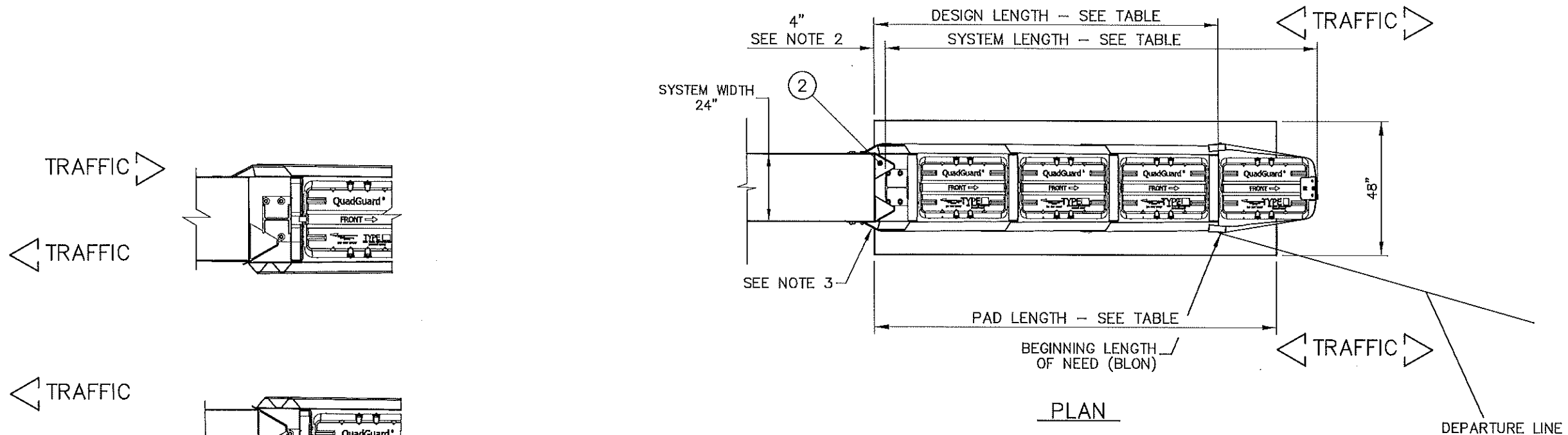
SHEET: 7 of 13



VALTIR

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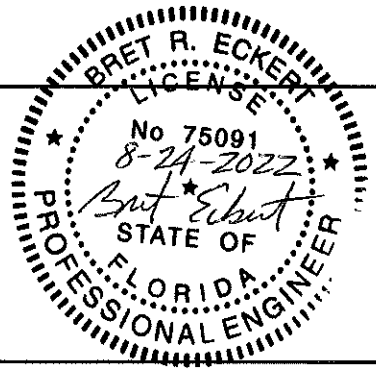
QMS-FE-048 Rev 0, (06-01-2022)



- NOTES:
1. CAUTION  $\phi$  OF QUADGUARD® M10 SYSTEM SHALL BE PARALLEL WITH  $\phi$  OF BARRIER  $\pm 1'$ .
  2. CAUTION: MAX. 4" CLEARANCE BETWEEN BACKUP AND BARRIER WALL. ZERO CLEARANCE RECOMMENDED.
  3. TRANSITION PANEL SHALL BE ANGLED SUCH THAT MAXIMUM GAP FROM FENDER PANEL OVERLAP DOES NOT EXCEED .78".

| PERMANENT CRASH CUSHION DESIGN TABLE |                      |                  |                  |               |                 |               |                   |         |
|--------------------------------------|----------------------|------------------|------------------|---------------|-----------------|---------------|-------------------|---------|
| BAYS                                 | 24" WIDTH<br>MODEL # | SYSTEM<br>LENGTH | DESIGN<br>LENGTH | PAD<br>LENGTH | DESIGN<br>SPEED | TEST<br>LEVEL | NO. OF CARTRIDGES |         |
|                                      |                      |                  |                  |               |                 |               | TYPE I            | TYPE II |
| 3                                    | QM7024               | 13'-0"           | 10'-2"           | 12'-0"        | 43 mph          | TL-2          | 3                 | 1       |

NOTE: FOR LOW SPEED FACILITIES WITH A DESIGN SPEED OF  $\leq 45$  MPH USE A TL-2 SYSTEM.



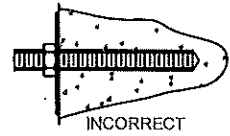
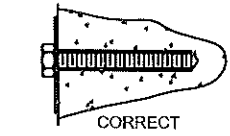
| KEY |                  |
|-----|------------------|
| ①   | TRANSITION PANEL |
| ②   | WHEEL DEFLECTOR  |

|  |                     |                                     |   |                |     |     |     |     |
|--|---------------------|-------------------------------------|---|----------------|-----|-----|-----|-----|
| DRAWN:<br>J. SIMMONS   | DATE:<br>04/09/2020 | MODEL:<br>SEE TABLE                 | QUADGUARD® M10 24" TL-2 (PERMANENT)<br>TO VERTICAL CONCRETE BARRIER |                |     |     |     |     |
| CHECKED:<br>B. ECKERT  | DATE:<br>04/17/2020 | TRAFFIC DIRECTION:<br>BIDIRECTIONAL | APL 544-002-003   |                |     |     |     |     |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH.<br>DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND OMS-SE-003<br>UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE<br>DRAWING             |   |                |     |     |     |     |
| REVISION DESCRIPTION   | ECO                 | DATE                                |   |                |     | REV | BY  | CHK |
| UPDATED APL NUMBER, DESIGN LENGTH AND DEPARTURE LINE   | 7204                | 06/05/20                            |   |                |     | A   | JMS | BRE |
| WAS SHEET 10   | 7427                | 05/27/21                            |   |                |     | B   | JMS | BRE |
| BORDER WAS THP BORDER  | 8151                | 08/17/22                            | C   | RJV            | RCB |     |     |     |
| DRAWING: 60-45-47  |                     |                                     | REV: C  | SHEET: 8 of 13 |     |     |     |     |

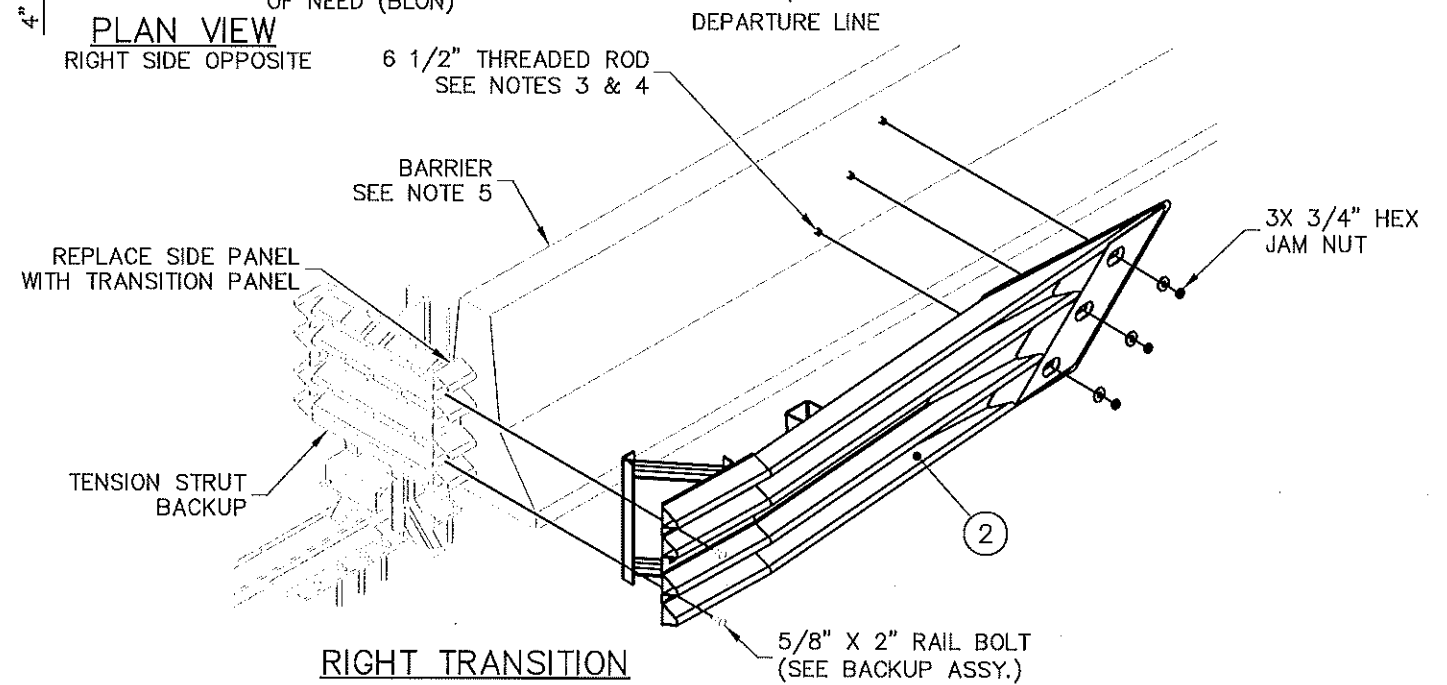
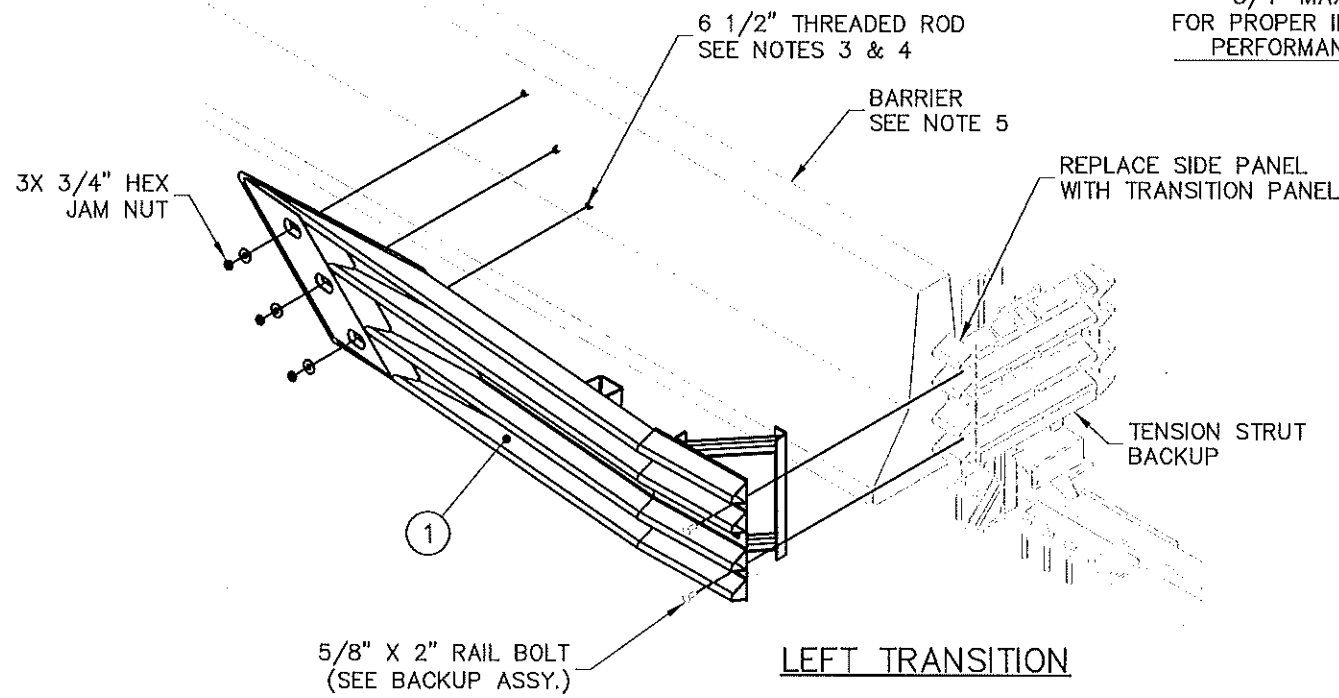
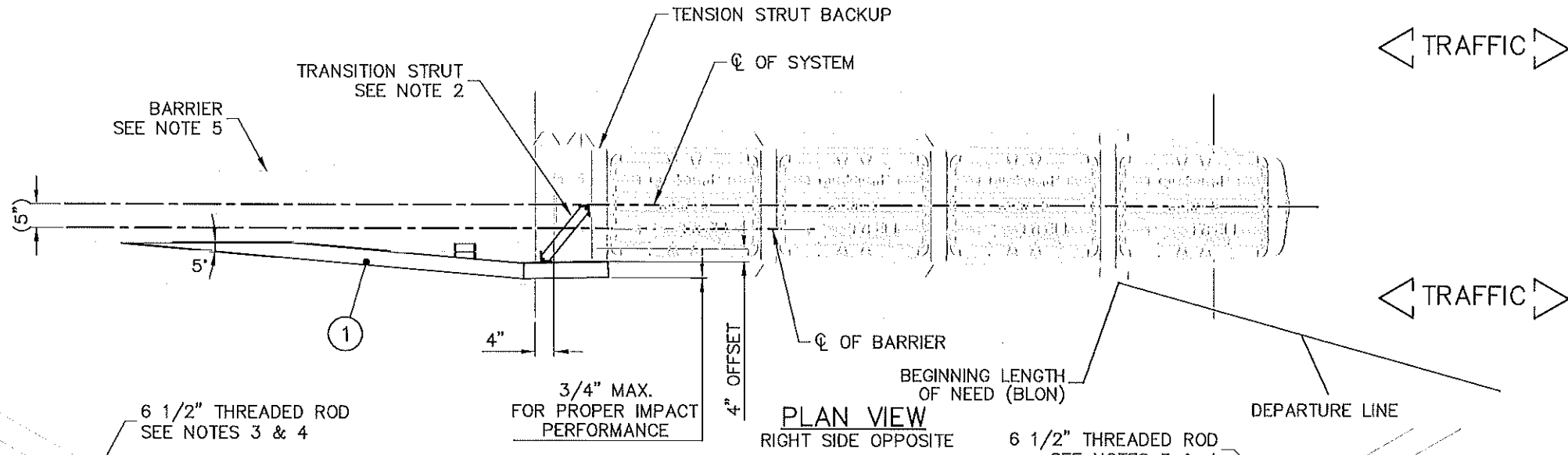


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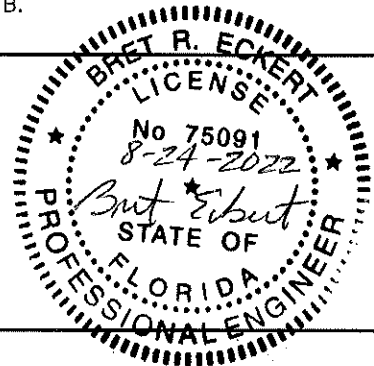




DETAIL B



- NOTES:
1. IMPACT FORCES COULD BE TRANSFERRED INTO TERMINAL END OF THE BARRIER. ADEQUATE ANCHORAGE IS REQUIRED FOR PROPER IMPACT PERFORMANCE.
  2. POSITION TRANSITION STRUT TO CONTACT (1/4" GAP ACCEPTABLE) WIDE FLANGE BEAM OF BACKUP BEFORE ATTACHING TO BACKUP AND ANCHORING TO BARRIER.
  3. USE TRANSITION PANEL AS TEMPLATE FOR DRILLING. ENSURE FLUSH FIT TO BARRIER. RECOMMENDED HOLE DEPTH 5. FINAL TORQUE TO BE 100 FT-LBS (TYP).
  4. ANCHOR STUD END SHOULD BE FLUSH WITH OUTSIDE SURFACE OF ANCHOR NUT, SEE DETAIL B.
  5. STATE APPROVED SAFETY SHAPE (NJ, F, K) CONCRETE BARRIER.



| KEY |                          |
|-----|--------------------------|
| ①   | TRANSITION ASSY, 4 IN, L |
| ②   | TRANSITION ASSY, 4 IN, R |

|  |                     |                                     |
|--|---------------------|-------------------------------------|
| DRAWN:<br>J. SIMMONS   | DATE:<br>04/09/2020 | MODEL:<br>SEE TABLE                 |
| CHECKED:<br>B. ECKERT  | DATE:<br>04/17/2020 | TRAFFIC DIRECTION:<br>BIDIRECTIONAL |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH. DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND DMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE DRAWING                |
| REVISION DESCRIPTION   |                     |                                     |
| UPDATED APL NUMBER, UPDATED DEPARTURE LINE, REMOVED TEMPORARY FROM TITLE BLOCK   | 7204                | 06/05/20 A JMS BRE                  |
| WAS SHEET 11   | 7427                | 05/27/21 B JMS BRE                  |
| BORDER WAS THP BORDER  | 8151                | 08/17/22 C RJV RCB                  |

|  |
|--|
| QUADGUARD® M10 24" TL-2 (PERMANENT) TO SAFETY SHAPE CONCRETE BARRIER |
| APL 544-002-003  |
| FLORIDA  |
| DRAWING: 60-45-47  |
| REV: C   |

VALTIR

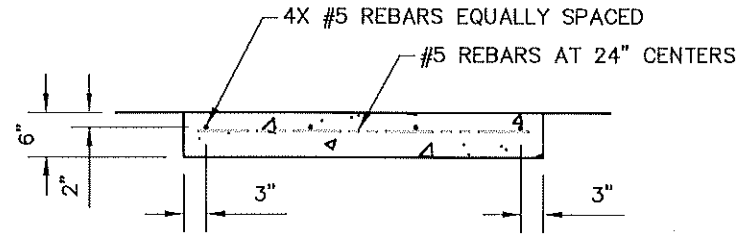
FLORIDA

SHEET: 9 of 13

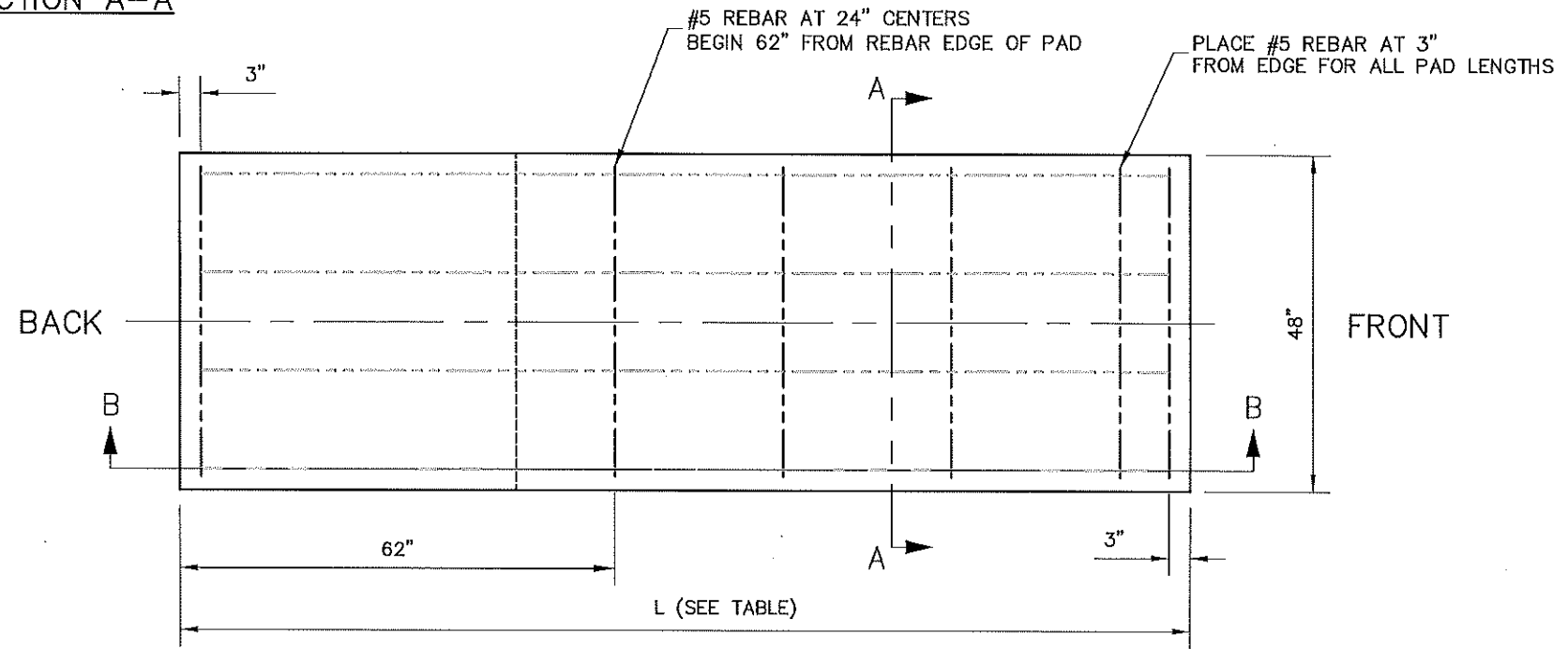
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QNS-FE-048 Rev 6, (06/01/2022)

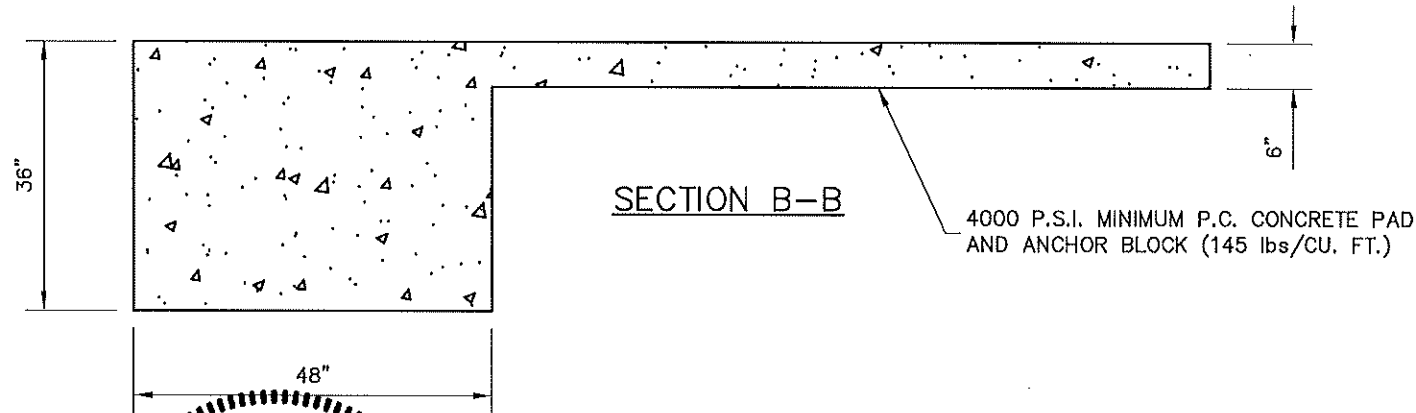
| TABLE       |                  |                |                                       |
|-------------|------------------|----------------|---------------------------------------|
| NO. OF BAYS | "L" (PAD LENGTH) | REBAR REQUIRED | YARDS <sup>3</sup> OF CONCRETE IN PAD |
| 3           | 12'-0"           | 68'-0"         | 2.4                                   |



SECTION A-A

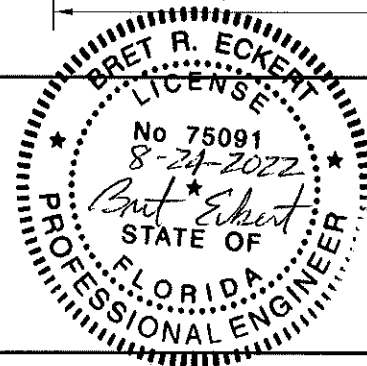


PLAN VIEW



SECTION B-B

- NOTES:
- CROSS SLOPE OF PAD SHALL NOT EXCEED 1:10 AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
  - ANCHOR BLOCK LOCATION IS RECOMMENDED AT BACK OF CONCRETE PAD. EXISTING CONCRETE PADS OR NEW PADS WITH BELOW GROUND OBSTRUCTIONS ARE ACCEPTABLE WITH ANCHOR BLOCKS LOCATED AT THE FRONT OF THE PAD.



|  |            |          |            |                      |     |
|--|------------|----------|------------|----------------------|-----|
| DRAWN:   | J. SIMMONS | DATE:    | 04/09/2020 | MODEL:               | N/A |
| CHECKED:   | B. ECKERT  | DATE:    | 04/17/2020 | TRAFFIC DIRECTION:   | N/A |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH. DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND QMS-SE-003 UNLESS OTHERWISE SPECIFIED. |            |          |            | DO NOT SCALE DRAWING |     |
| REVISION DESCRIPTION   | ECO        | DATE     | REV        | BY                   | CHK |
| UPDATED APL NUMBER   | 7204       | 06/05/20 | A          | JMS                  | BRE |
| WAS SHEET 5  | 7427       | 05/27/21 | B          | JMS                  | BRE |
| BORDER WAS THP BORDER  | 8151       | 08/17/22 | C          | RJV                  | RCB |

QUADGUARD® M10 24" TL-2 (PERMANENT)  
CONCRETE PAD WITH ANCHOR BLOCK

APL 544-002-003

FLORIDA

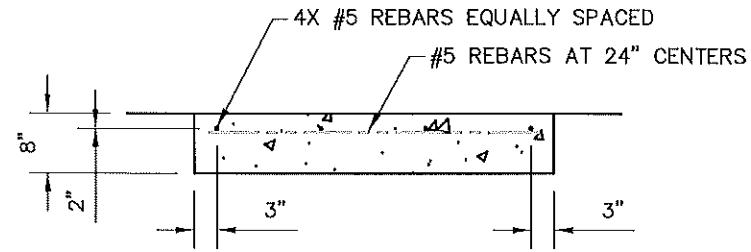
DRAWING: 60-45-47

REV: C

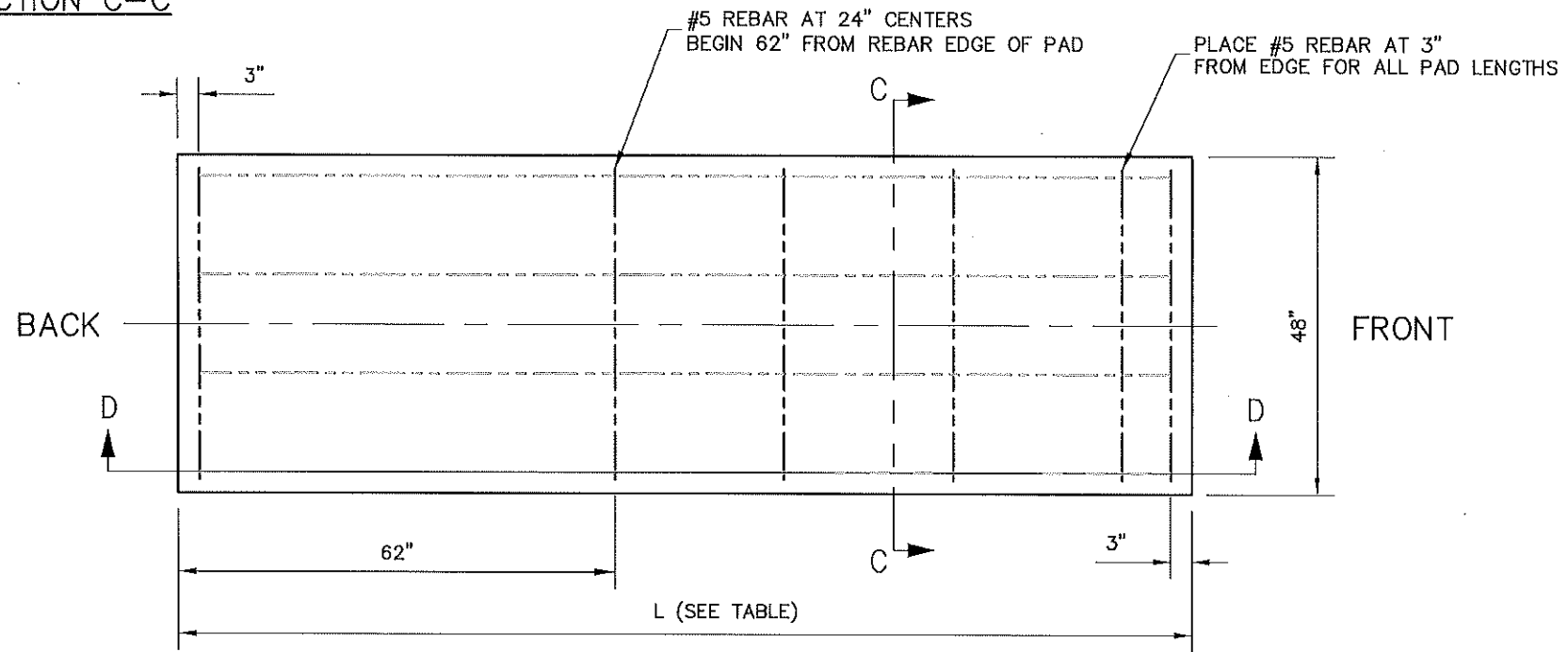
SHEET: 10 of 13



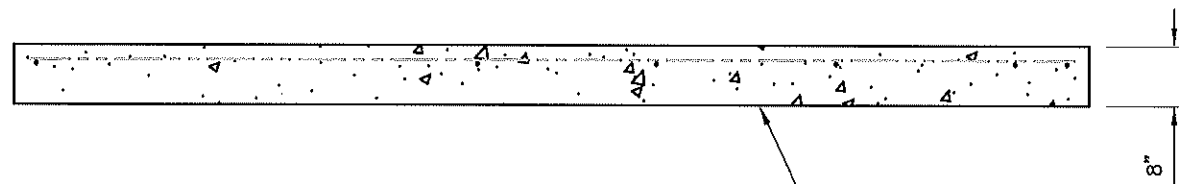
| TABLE       |                  |                |                          |
|-------------|------------------|----------------|--------------------------|
| NO. OF BAYS | "L" (PAD LENGTH) | REBAR REQUIRED | YARDS OF CONCRETE IN PAD |
| 3           | 12'-0"           | 68'-0"         | 1.2                      |



SECTION C-C



PLAN VIEW

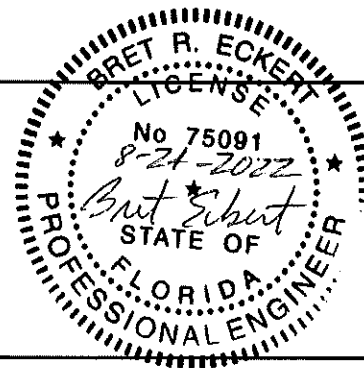


SECTION D-D

4000 P.S.I. MINIMUM P.C. CONCRETE PAD AND ANCHOR BLOCK (145 lbs/CU. FT.)

NOTES:

- CROSS SLOPE OF PAD SHALL NOT EXCEED 1:10, AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
- TO PREVENT SLIDING DURING AN IMPACT, PAD MUST BE INSTALLED AGAINST OR TIED TO AN EXISTING STRUCTURE. OTHERWISE ADDITIONAL BELOW GRADE SUPPORTS MUST BE ADDED AS DETERMINED NECESSARY BY THE PROJECT ENGINEER.



|  |                  |                        |
|--|------------------|------------------------|
| DRAWN: J. SIMMONS  | DATE: 04/09/2020 | MODEL: N/A             |
| CHECKED: B. ECKERT   | DATE: 04/17/2020 | TRAFFIC DIRECTION: N/A |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH. DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND QMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                  | DO NOT SCALE DRAWING   |
| REVISION DESCRIPTION   | ECO              | DATE                   |
| UPDATED APL NUMBER, TABLE, AND NOTES   | 7204             | 06/05/20               |
| WAS SHEET 6  | 7427             | 05/27/21               |
| BORDER WAS THP BORDER  | 8151             | 08/17/22               |

QUADGUARD® M10 24" TL-2 (PERMANENT) CONCRETE PAD, 8" REINFORCED

APL 544-002-003

FLORIDA

DRAWING: 60-45-47

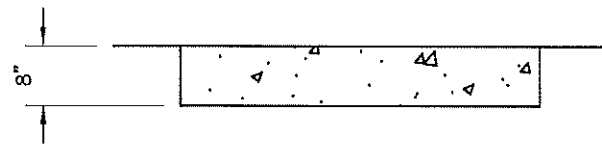
REV: C

SHEET: 11 of 13

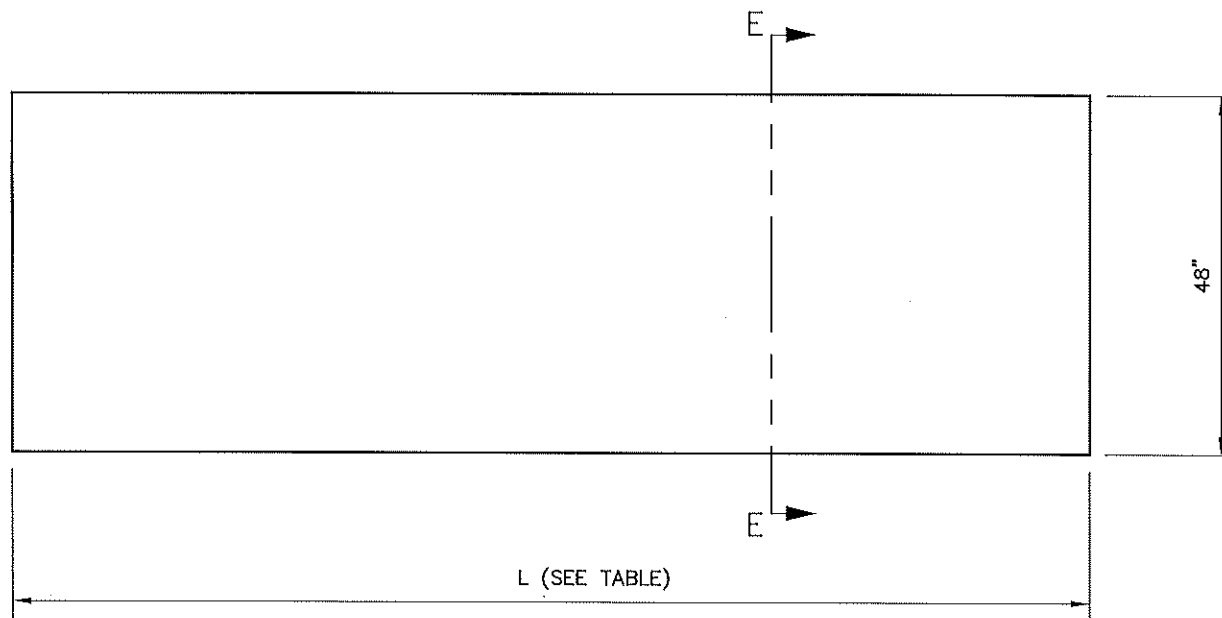


VALTIR

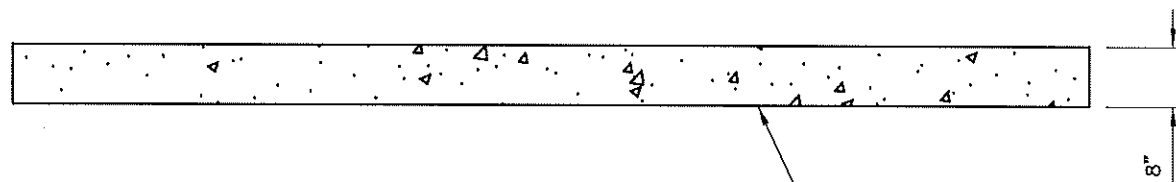
| TABLE       |                  |                          |
|-------------|------------------|--------------------------|
| NO. OF BAYS | "L" (PAD LENGTH) | YARDS OF CONCRETE IN PAD |
| 3           | 12'-0"           | 1.2                      |



SECTION E-E



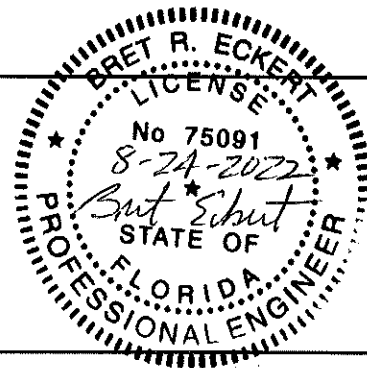
PLAN VIEW



ELEVATION VIEW

4000 P.S.I. MINIMUM P.C. CONCRETE PAD AND ANCHOR BLOCK (145 lbs/CU. FT.)

- NOTES:
- CROSS SLOPE OF PAD SHALL NOT EXCEED 1:10, AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
  - TO PREVENT SLIDING DURING AN IMPACT, PAD MUST BE INSTALLED AGAINST OR TIED TO AN EXISTING STRUCTURE. OTHERWISE ADDITIONAL BELOW GRADE SUPPORTS MUST BE ADDED AS DETERMINED NECESSARY BY THE PROJECT ENGINEER.



|  |                     |                           |
|--|---------------------|---------------------------|
| DRAWN:<br>J. SIMMONS   | DATE:<br>01/04/2021 | MODEL:<br>N/A             |
| CHECKED:<br>B. ECKERT  | DATE:<br>01/07/2021 | TRAFFIC DIRECTION:<br>N/A |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH. DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND OMS-SE-003 UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE DRAWING      |
| REVISION DESCRIPTION   | ECO                 | DATE                      |
| ADDED THIS SHEET, SHEET 12 BECAME SHEET 13   | 7247                | 05/27/21                  |
| BORDER WAS THP BORDER  | 8151                | 08/17/22                  |
|  |                     |                           |
|  |                     |                           |
|  |                     |                           |
|  |                     |                           |

QUADGUARD® M10 24" TL-2 (PERMANENT)  
CONCRETE PAD, 8" NON-REINFORCED

APL 544-002-003

FLORIDA

DRAWING: 60-45-47

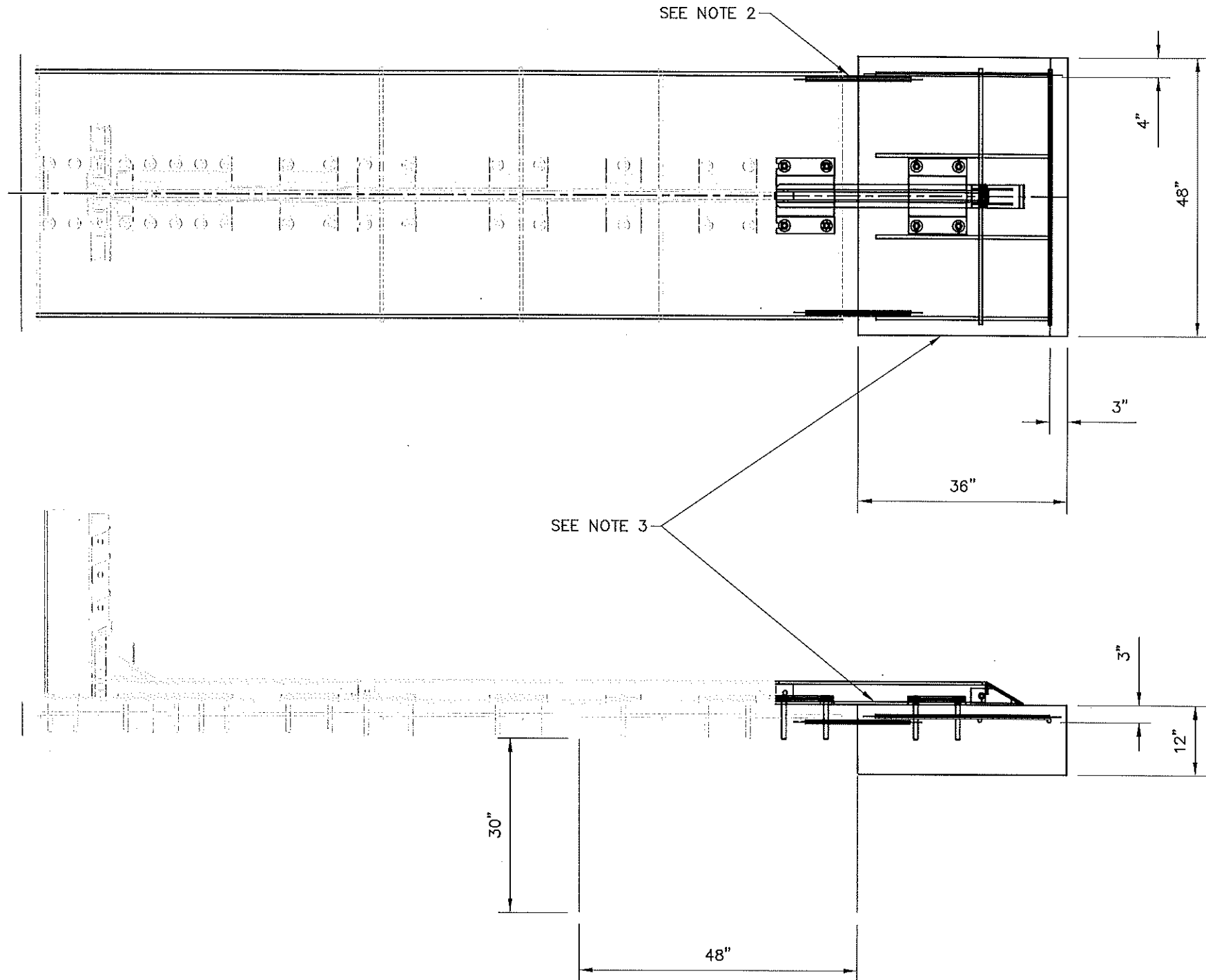
REV: C

SHEET: 12 of 13



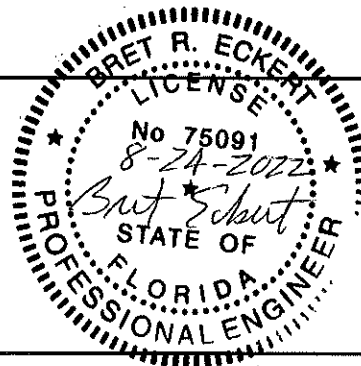
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**NOTES:**

1. USE THESE DETAILS IN COMBINATION WITH QUADGUARD® II DRAWINGS (APL 544-000-043) TO CONVERT A 2-BAY QUADGUARD® II CONCRETE PAD TO 3-BAY QUADGUARD® M10 CONCRETE PAD.
2. DOWEL PADS WITH (QTY. 3)  $\phi 3/4$ " [#6] X 18" LONG AT APPROX. 3" CLEAR TOP FACE. REBAR TO BE GRADE 60 EPOXY COATED. BIND WITH SAME EPOXY AS USED FOR SURFACE OF JOINT.
3. EXTEND CONCRETE PAD 3' LONG X 4' WIDE. EXISTING CONCRETE SURFACE TO BE TREATED WITH EPOXY (SIKADUR 32 OR BURKE HI-VIS OR EQUAL). PAD ADDITION TO BE 12" MIN. THICK, 4000 PSI MIN. REINFORCE WITH  $\phi 5/8$ " [#5] BOTH WAYS AT 12" MAX. CENTERS AT 2" MIN. CLEAR TOP FACE.



|  |                     |                           |
|--|---------------------|---------------------------|
| DRAWN:<br>J. SIMMONS   | DATE:<br>04/09/2020 | MODEL:<br>N/A             |
| CHECKED:<br>B. ECKERT  | DATE:<br>04/17/2020 | TRAFFIC DIRECTION:<br>N/A |
| UNLESS OTHERWISE NOTED, DIMENSIONS ARE IN INCH.<br>DIMENSIONS ACCORDING TO ASME Y14.5-2018 AND OMS-SE-003<br>UNLESS OTHERWISE SPECIFIED. |                     | DO NOT SCALE<br>DRAWING   |
| REVISION DESCRIPTION   | ECO                 | DATE                      |
| UPDATED APL NUMBER AND NOTES   | 7204                | 06/05/20                  |
| WAS SHEET 12   | 7427                | 05/27/21                  |
| BORDER WAS THP BORDER  | 8151                | 08/17/22                  |
|  | REV                 | BY                        |
|  | A                   | JMS                       |
|  | B                   | JMS                       |
|  | C                   | RJV                       |
|  | CHK                 | RCB                       |
|  | BRE                 | BRE                       |

QUADGUARD® M10 24" TL-2 (PERMANENT)  
CONVERSION  
  
APL 544-002-003  
  
FLORIDA  
DRAWING: 60-45-47  
REV: C



FLORIDA  
SHEET: 13 of 13

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