

SECTION 02841

PARKING BUMPERS, SPEED BUMPS, AND SPEED HUMPS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes: Division 2 applies to this section.
Provide parking bumpers and speed bumps, complete.
- B. Related Work specified elsewhere:
 - 1. Section _____: Cast-In-Place Concrete.
 - 2. Section _____: Asphaltic Concrete Paving.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. C531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-resistant Mortars, Grouts and Monolithic Surfacing.
 - 2. C642 Test Method for Density, Absorption and Voids in Hardened Concrete.
 - 3. C672 Test Method for Scaling Resistance of Concrete Surfaces Exposed to De-icing Chemicals.
 - 4. D412 Test Methods for Rubber Properties in Tension.
 - 5. D573 Test Method for Rubber – Deterioration in an Air Oven.
 - 6. D395 Standard Test Methods for Rubber Property – Compression Set.
 - 7. D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
 - 8. D2240 Test Method for Rubber Property – Durometer Hardness
 - 9. D2370 Test Method for Tensile Properties of Organic Coatings.
 - 10. D4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.

1.03 SUBMITTALS

- A. Product Data: Submit for all products proposed for use, describing physical characteristics, sizes, patterns and method of installation.
- B. Shop Drawings: Submit dimensioned location plan and attachment details.
- C. Test Reports: Provide certified test reports, prepared by an independent testing laboratory, showing conformance to specified quality standards. Test results shall represent average results for production goods and shall be not over two (2) years old.
- D. Closeout Submittals:
 - 1. Maintenance Data:
Submit manufacturer's recommended cleaning and maintenance data as specified in Section 01700. Include maintenance procedures, recommended maintenance materials and suggested schedule for cleaning.

1.04 SUBSTITUTIONS

- A. Refer to Section 01630 for procedures.
- B. Proposed substitutions to be considered shall be manufactured of equivalent materials that meet or exceed specified requirements of this Section.
- C. Proposed substitutions shall be identified not less than ten (10) days prior to bid date.

1.05 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer:

Company with a minimum of two (2) years documented experience in the installation of similar recycled rubber systems and approved by the manufacturer.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the installation site in the manufacturer's original packaging. Packaging shall contain manufacturer's name, product color, identification number and other related information.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. GNR Technologies Inc., 990 Upton Street, Ville LaSalle, Quebec, Canada H8R 2T9 – Phone (800) 641-4143, Fax (514) 366-6440.

2.02 MATERIALS

- A. Rubber composite material: 100 percent recycled rubber with polyurethane prepolymer binder, compression molded; resistant to UV, moisture and oil; complying with the following:

1. ASTM C642 Minimum density of 0.6 oz/cu.in. minimum.
2. ASTM D2240 Minimum Durometer hardness of 65A ± 7.
3. ASTM D412 Minimum 210 psi tensile strength of primary structural components.
4. ASTM D395 Minimum compression deformation of 10 percent at 70 psi and 68 degrees F.
5. ASTM D746 Low temperature brittleness of -40 degrees F.
6. ASTM C672 Freeze and thaw when exposed to de-icing chemicals producing no loss after 50 cycles.
7. ASTM C531 Coefficient of thermal expansion of at least 8×10^{-6} in./in./degrees F.
8. ASTM D573 Weathering for a minimum of 70 hours at 158 degrees F with the following minimum results:
 - a. Hardness retained: 100 percent (± 5 percent).
 - b. Compressive strength: 100 percent (± 5 percent).
 - c. Tensile strength: 100 percent (± 5 percent).
 - d. Elongation retained: 100 percent (± 5 percent).
 - e. Hardness retained: 100 percent (± 5 percent).

- B. Reflective Material: GNR Technologies "Reflect Guard" thermally embedded reflective material, complying with the following:

1. ASTM D2370 Tensile strength, minimum 1,000 psi.
2. ASTM D2370 Elongation, 200 percent minimum.
3. ASTM D4060 Abrasion, maximum 20 mg loss.

- C. Adhesive: GNR Technologies "PL Premium" urethane adhesive, non-toxic, non-flammable, waterproof; complying with the following:

1. Viscosity: Tensile strength, minimum 1,000 psi, when tested to ASTM D2370.
2. Solids: 95 percent ± 2 percent.
3. Color : Light brown.
4. Working or Open Time: Up to one hour.

5. Weight per Gallon: 10.5 pounds.
 6. Flash Point: 250 degrees F.
 7. Freeze-Thaw Stability: Does not freeze.
 8. Storage Stability: One year.
 9. Shrinkage: None.
 10. Maximum VOC: 100 grams per liter.
- D. Stakes: GNR Technologies 14 inch length steel spikes, ½inch diameter, capped; coated with corrosion-resistant black paint.
- E. Lag Bolts: 12" length steel bolts, ½inch diameter; with ½inch steel washer.
- F. Lag Bolts: 5 inch length steel bolts with lead shields, ½inch diameter; coated with corrosion-resistant black paint.
- G. Lag Bolts: 5 inch length steel bolts with polyethylene shields, ½ inch diameter; coated with corrosion-resistant black paint.

2.03 MANUFACTURED UNITS

- A. Parking bumpers shall be GNR Technologies "Park-It", manufactured of 100 percent recycled rubber, ground and blended with polyurethane prepolymer.
1. Resistant to warping, cracking, chipping and rotting.
 2. Flexible and capable of conforming to irregularities in paving surface.
 3. Finish: Black body with "Reflect Guard" applied reflective material.
 - a. Yellow reflective parallelogram stripes.
 - b. Blue reflective parallelogram stripes.
 - c. White reflective parallelogram stripes.
 4. Sizes:
 - a. 4- ¼inch by 6 inch by 48 inch. Total weight: 23 pounds.
 - c. 4- ¼inch by 6 inch by 72 inch. Total weight: 33 pounds.
- B. Speed bumps shall be GNR Technologies "Easy Rider", manufactured of 100 percent recycled rubber from tires, blended with polyurethane prepolymer.
1. Resistant to warping, cracking, chipping and rotting.
 2. Flexible and capable of conforming to irregularities in paving surface.
 3. Channel bottom: Continuous channel, minimum 1¼inch x 1¼inch, for drainage, piping and cabling.
 4. Finish: Black body with "Reflect Guard" applied reflective material.
 - a. Yellow reflective parallelogram stripes.
 5. Reflectors: Recessed imbedded cat-eye reflectors, centered in black stripes.
 6. Sizes:
 - a. 2¼inch by 12 inch by 48 inch. Total weight: 31 pounds.
 - b. 2¼inch by 12 inch by 72 inch. Total weight: 47 pounds.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that substrates are smooth and flat and ready to receive the Work.

- B. Verify that pavement and ambient air temperature are within temperature range recommended for proper curing of adhesive. Do not install with adhesive when pavement is wet or rain is anticipated.
- 3.02 PREPARATION
- A. Clean and remove debris and dust from pavement surface and surrounding area. Wash pavement with water and allow to dry.
- 3.03 PARKING BUMPERS INSTALLATION
- A. Installation on asphaltic or concrete paving: Attach loose bumpers to asphalt paving with stakes. Drill 1/4 inch diameter holes through indicated marks on bumper, penetrating bumper to reach substrate material. Drive 14 inch spikes or 12" lag bolt with washer through bumper holes and into substrate until flush with top of bumper.
 - B. Installation on concrete paving: Adhere bumpers to concrete with PL Premium adhesive in accordance with manufacturer's installation instructions. Reposition and adjust bumpers within one hour of adhesive application. Allow adhesive to cure undisturbed for four (4) hours minimum.
- 3.04 SPEED BUMPS INSTALLATION
- A. Installation on concrete paving: Attach loose speed bumps to concrete paving with stakes. Drill 1/4 inch diameter holes through indicated marks on bumper, penetrating bumper to reach substrate material. Drive 14 inch spikes or 12" lag bolt with washer through bumper holes and into substrate until flush with top of speed bump.
 - B. Installation on concrete paving: Attach loose speed bumps to asphalt paving with lag bolts. Drill holes through indicated marks on bumper; size of hole determined by diameter of shield. Drill holes 1 inch longer than length of shield. Use 5 inch by 1/2 inch lag bolts with lead shields. Tighten lag bolts until securely fastened into substrate and flush with top of speed bump.
- 3.05 FIELD QUALITY CONTROL
- A. Arrange for manufacturer to provide field service specialist at commencement of installation to instruct installer in methods and to assure that project conditions are satisfactory.
- 3.06 ADJUSTING
- A. Adhesive allows repositioning within the first hour after application. Immediately after placement, adjust and reposition bumpers parallel to parking space and centered in the space width.
- 3.07 CLEANING
- A. Immediately after placement and adjustment, remove excessive adhesive.
- 3.08 PROTECTION
- A. Protect finished installation under provisions of Section 01300.

– END OF SECTION –