

CLOVERLEAF CORPORATION

High Tension Cable Barriers

Prepared for FDOT D1 TIM
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This presentation was made for informational purposes only and should not be a substitute for field training. Level of detail presented here is not sufficient for installation or maintenance training as required by FDOT Developmental Specification 540.

CLOVERLEAF CORPORATION



NUCOR Cable Barrier



QWICK KURB®



Safeguard Link Barrier Gate



TAU-II™ Crash Cushion



QMB



Safe-T-Grip High Friction Surface



NUCOR High Tension Cable Barrier – I-75 & I-275, FDOT District 1

Information in this presentation is specific to the NUCOR high tension barrier system.

The Nucor high tension cable barrier is installed in the median on I-75 & I-275 in Manatee, Sarasota, Charlotte and Lee counties.

There are three categories of cable barriers:

- Warning Cable System: System does not contain or redirect vehicle but indicates there has been a breach (Alligator Alley along Canal)
- Low Tension Cable Barrier: Barrier may redirect vehicle but is designed to contain it by wrapping vehicle in wire ropes. Significant collateral damage to barrier when impacted. Wire ropes tensioned to below 1,000 lbs. FDOT does not allow the use of low tension cable barrier on their roadway
- High Tension Cable Barrier: Barrier designed to redirect vehicles onto impact side of barrier. Wire ropes tensioned to 5,600 lbs. FDOT only allows the use of high tension cable barriers on their roadways.



Crash Tested
By Texas Transportation Institute (TTI)

Typically Minor Damage to Impacting Vehicles



Two Major Components



Wire Rope &
Supporting Posts

Wire Rope

- Uses standard $\frac{3}{4}$ " 3-strand braided steel wire rope that has been pre-tensioned. Weight – 0.857 lbs/FT
- Initial tension is induced by physically shortening the wire rope thereby stretching the individual tendons.
- Tensioned to 5,600 lbs after installation (@ 70°F).
- Tension is measured with a meter – no accurate visual method of measuring tension.

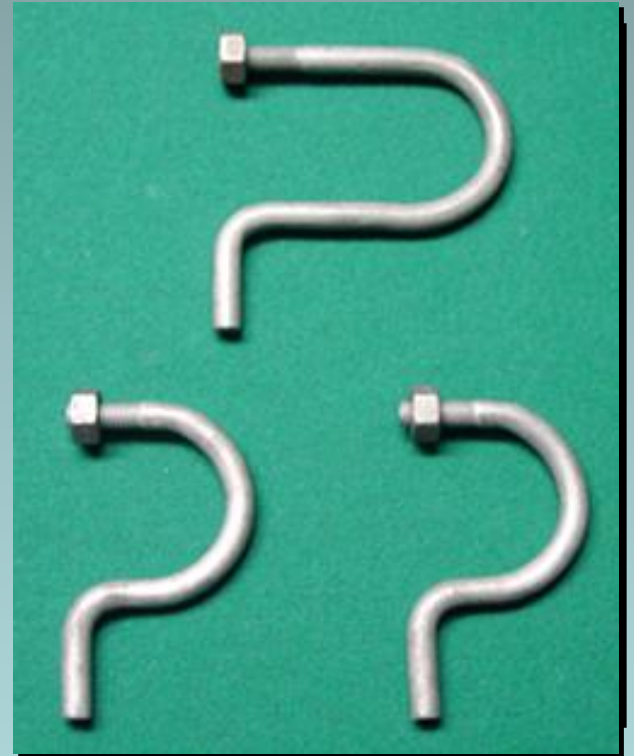
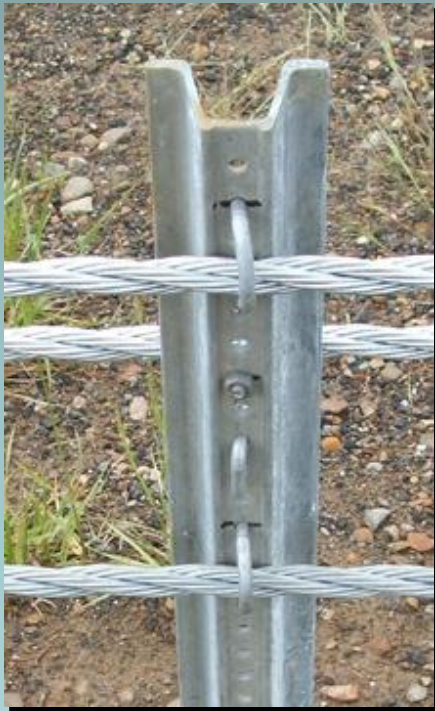


- Top Wire Rope – 29.5” from ground
- Middle Wire Rope – 25.5” from ground
- Bottom Wire Rope – 21.5” from ground

These distances above the ground have been determined through FHWA crash testing procedures. Grading of the approach slopes to the barrier is critical in maintaining these design heights.



Posts & hardware



High carbon steel line post weighs about 16 lbs.
Three locking Hook Bolts attach cable to post. Nuts are on finger tight.

Posts

- Posts are slipped inside a steel tube that is encased in concrete
- Posts are spaced 16' apart except where approaching end terminals, where they are closer together



Turnbuckle & Cable End – Tension induction/reduction fittings



Turnbuckle



Cable end fitting



Relaxing Tension



- Tension can be relaxed by unwinding turnbuckles/cable ends to their maximum length.
- Recommend a two person operation – one person holding the hubs steady to prevent wire rope from rotating. Other person turns open body of turnbuckle.

Relax Tension

- In emergency situation, the CRPs or trigger posts can be longitudinally run over (slowly) with a truck. The posts will simply lay down and release the tension. Both style posts can be reused.









The tension has been relaxed, but the wire ropes are still hanging on the posts. The posts can be removed from their sockets easily. The hook bolts can also be removed from the posts and the cable will lay itself down.

Cutting cable in an Life Saving Emergency

- Recommended to relax tension first if possible. A vehicle trapped in the cable barrier can create higher than normal tensions.
- Use abrasive wheel saw
- Ensure no one is near the cutting point, both upstream and down stream
- The locking Hook Bolts will help keep the rope from whipping great distance. If possible, the rope can be clamped to the hook bolts with vice-grips.





- To get 3' slump in cables from gravity:
 - @ 5,600 lbs tension – 330' unsupported cable (approx 21 posts)
 - @ 850 lbs tension (approximate “dead” tension in the wire rope when not under system tension) – 129' unsupported cable (approx 8 posts)

Repairing a cut rope



These fittings can be used to splice the wire rope back together. The cable splice (bottom picture) is the simplest because it will not lengthen the wire rope. Since the turnbuckle is almost 3 feet long, an additional 3 foot of wire rope needs to be cut out before splicing the turnbuckle in.



Questions? Call Cloverleaf 813-649-1336