BEA 2026 Retractor Plan

24V DC on 12/3 down an LMG 50 ft cable retractor at the 4 winch feed points · fixed drops at the 3 audience chain motors · rev Aug 31, 2026

Input to each flown PWR-NJCT: powerCON TRUE1 AC mains, no data. AC runs up to the box, the box converts to 24V DC at height, and the DC goes down the retractor into the rope. Data never enters an injector; every run is driven from its PXL-CTRL at the pylon, through the rope itself.

The tour winch is the **Wahlberg Winch 50**, which has no power or data pass-through, so LED power and data cannot ride the winch. Each of the four DS/US winch PWR-NJCT positions instead gets a **50 ft self-retracting cable reel, provided by LMG, clamped in the truss beside the winch, carrying 12/3**. Four retractors is the whole count for now (winch + power inject at NJCT 1 to 4). The retractor carries the 24V DC drop (two +24V legs and a shared negative on Chance's NL4 pin map) down to the rope and pays out and takes up with the winch travel. **The three audience pickups (AP 1/2/3) do not winch** (confirmed on the Aug 18 production call): they hang from chain motors, fly to trim and stay static, so their PWR-NJCT drops are fixed-length cables lashed to the black pickup cable, no retractor. The fixed AP drops are our own 12/3 SOOW; the winch drops are 12/3 on LMG's reels, one gauge for all four. No conversion pod, and the deck racks stay 24V. The cost is one more moving cable managed at each of the four winches, and on a 50 ft reel the full 50 ft of copper is always in the circuit (the drum and slip ring carry it whether it is paid out or not), so the winch drops see more voltage drop than the 14 ft of travel would suggest; numbers below.

PWR-NJCT details and drop gauge

Gauge of record: **12/3 SOOW on every drop** (decision Aug 31, supersedes the Aug 26 #10 pick). Loads are the live per-box figures from /segments at the measured 23.04 W/m. The shared negative carries the full box current, so the gauge is set by the box total. Drop lengths: DS/US is 14 ft of winch travel, but the electrical length is the full 50 ft on the LMG reel (all of it is in circuit through the slip ring), so V-drop for NJCT 1 to 4 is figured on 50 ft; audience per Sheet 4.11 (fixed drops on the chain-motor pickups, no retractor); laser-verify every fixed drop before the cable order. V-drop at the winches is shown two ways: 12/3 (shared negative carries the box total) and 12/4 (both pairs landed on NL4 1+/1- and 2+/2-, each pair carries half). Cable OD and weight are typical SOOW values, verify against LMG's reel cable datasheet.

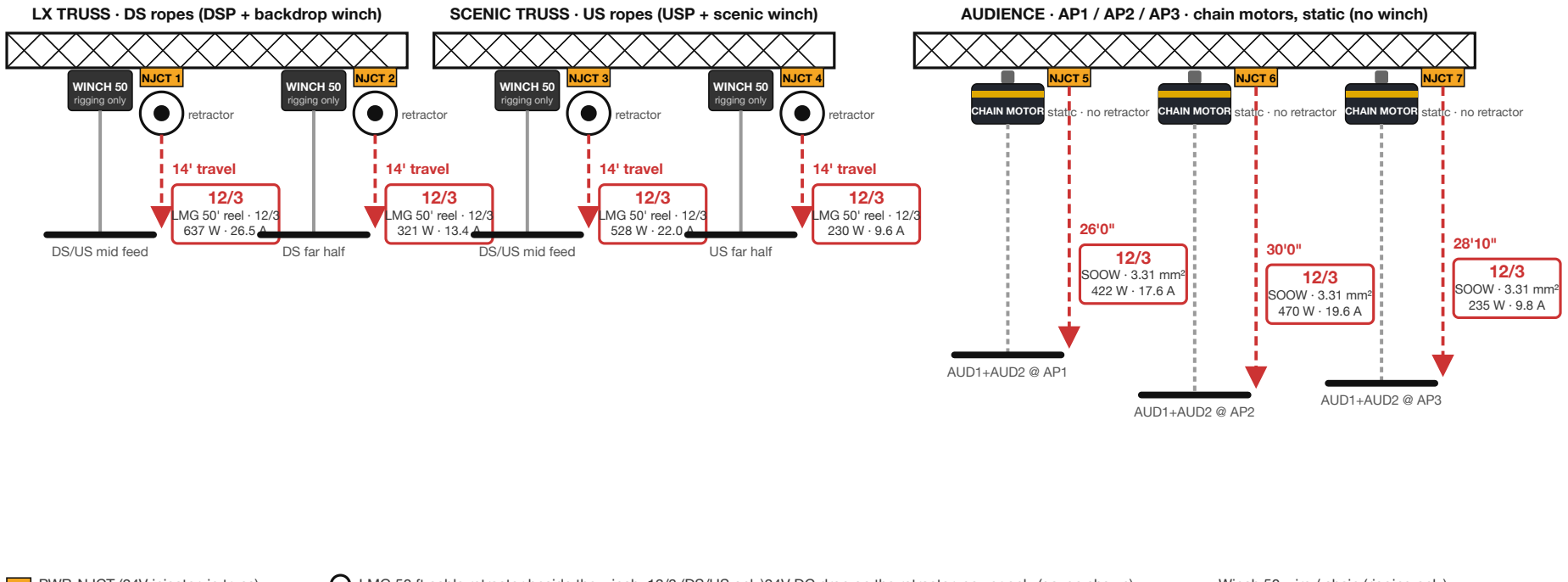
INJECTOR	POSITION	FEEDS	LOAD	DROP	24V AMPS	DROP CABLE	V-DROP	SOOW OD	WEIGHT	EDGE NOTE
PWR-NJCT 1	DS pickup (DSP), LX truss	mid feed, all 3 DS ropes	637 W	14' travel 50' reel	26.5 A	**12/3** 3.31 mm² · LMG 50 ft reel	17.5% (12/3) 8.8% (12/4)	≈0.50" / 12.7 mm	≈0.18 lb/ft	Heaviest drop. Land both pairs (12/4) to hold ~8.8%; with 12/3 the DS group master gets set around the ~17.5% full-white figure at rehearsal.
PWR-NJCT 2	DS end (backdrop truss winch)	far half of all 3 DS seg 2	321 W	14' travel 50' reel	13.4 A	**12/3** 3.31 mm² · LMG 50 ft reel	8.9% (12/3) 4.4% (12/4)	≈0.50" / 12.7 mm	≈0.18 lb/ft	Both pairs landed (12/4) holds ~4.4%.

INJECTOR	POSITION	FEEDS	LOAD	DROP	24V AMPS	DROP CABLE	V-DROP	SOOW OD	WEIGHT	EDGE NOTE
PWR-NJCT 3	US pickup (USP), scenic truss	mid feed, all 3 US ropes	528 W	14' travel 50' reel	22.0 A	**12/3** **3.31 mm² · LMG 50 ft reel**	14.6% (12/3) 7.3% (12/4)	≈0.50" / 12.7 mm	≈0.18 lb/ft	Land both pairs (12/4) to hold ~7.3%; with 12/3 the US group master gets set around the ~14.6% full-white figure at rehearsal.
PWR-NJCT 4	US end (scenic truss winch)	far half of all 3 US seg 2	230 W	14' travel 50' reel	9.6 A	**12/3** **3.31 mm² · LMG 50 ft reel**	6.4% (12/3) 3.2% (12/4)	≈0.50" / 12.7 mm	≈0.18 lb/ft	Lightest winch drop; ~3.2% with both pairs landed (12/4).
PWR-NJCT 5	AP1, chain motor (static, fixed drop)	AUD1 + AUD2 at AP1	422 W	26'0"	17.6 A	**12/3** **3.31 mm² · SOOW**	6.1%	≈0.50" / 12.7 mm	≈0.18 lb/ft	Decision (Aug 31): 12/3 here, one gauge on every drop. 6.1% round trip at full white on 26 ft; the AUD group master dials it in at rehearsal.
PWR-NJCT 6	AP2, chain motor (static, fixed drop)	AUD1 + AUD2 at AP2	470 W	30'0"	19.6 A	**12/3** **3.31 mm² · SOOW**	7.8%	≈0.50" / 12.7 mm	≈0.18 lb/ft	Decision (Aug 31): 12/3. 7.8% round trip at full white on the 30 ft run; the AUD group master dials it in at rehearsal.
PWR-NJCT 7	AP3, chain motor (static, fixed drop)	AUD1 + AUD2 at AP3	235 W	28'10"	9.8 A	**12/3** **3.31 mm² · SOOW**	3.7%	≈0.50" / 12.7 mm	≈0.18 lb/ft	12/3 fixed drop; 3.7% round trip at full white on 28'10".
Total	**4 retractors + 3 fixed drops**	**24 segments · 187.8 m**	**2,843 W**		**118.5 A**	**Winch drops NJCT 1 to 4: 12/3 on 4× LMG 50 ft retractors, nothing to buy but the NL4 tails at each end. Fixed drop buy: 3× 12/3 SOOW (AP1 26', AP2 30', AP3 28'10"), drop length + tails. Every drop on the job is 12/3.**				

One gauge everywhere: 12/3 (decision Aug 31, supersedes the Aug 26 #10 pick). The 50 ft reel replaces the per-position gauge pick at NJCT 1 to 4, and a self-retracting reel keeps its whole cable in the circuit, so the math runs on 50 ft, not the 14 ft of travel. Full-white figures at 12/3: NJCT 1 ~17.5% round trip with a shared negative (8.8% if the reel cable is 12/4 and both pairs are landed on the NL4 1+/1- and 2+/2-), NJCT 3 ~14.6% / 7.3%. Ask LMG for the reel model, conductor count (12/3 vs 12/4) and the reel's electrical rating. Group masters get set around the full-white figures at rehearsal (the injectors sit mid-run, so rope ends see reel drop plus rope drop). Fixed drops are 12/3 as well: AP1 ~6.1% at full white on 26 ft, AP2 ~7.8% on 30 ft, AP3 ~3.7%; the AUD group master dials them in. All winch drops terminate on NL4 (speakON). Rule stays: never unplug under load. AWG to metric: #12 = 3.31 mm².

Layout: retractor at each winch feed point, fixed drop at each audience chain motor

Same convention as the Power & Data Plan: amber = PWR-NJCT, red dashed = the 24V drop, grey = the pickup (winch wire or chain, rigging only). At DS/US the retractor clamps in the truss next to the winch and the drop follows the pickup down to the rope. At AP 1/2/3 the pickup is a chain motor that stays static in the show, so the drop is a fixed cable lashed to the black pickup cable.



Point weights at the retractor / winch positions

Point loads from /rigging (V2.2 geometry, rope planned at 0.5 kg/m, rings paired at every point, 1.8 kg feed-cable allowance at each injector column). At DS/US the retractor clamps to the truss chord beside the winch, so the reel and the drop cable load the **truss**, not the winch pickup: the winch line stays rigging only. At AP 1/2/3 there is no retractor: the fixed drop cable is lashed to the black pickup cable and its weight lands on the chain-motor point. At the winches the drop cable is the full 50 ft of 12/3 on the LMG reel (≈0.18 lb/ft, ≈4.1 kg; 12/4 ≈5 kg), and it sits on the reel, so the truss carries it in every winch position. Fixed-drop weights use the SOOW figures in the table above times the drop length. Retractor unit weight: LMG to supply the reel spec; add it per position on the truss.

POSITION	ROPES	POINT LOAD	LB	DROP CABLE	DROP CABLE WEIGHT	RETRACTOR UNIT
NJCT 1 DSP winch column (LX truss)	3	**16.4 kg**	36.1	12/3 × 50' on the LMG reel	≈4.1 kg (on the truss)	LMG 50 ft reel, wt TBD
NJCT 2 DS end column (backdrop winches)	3	9.5 kg	21.0	12/3 × 50' on the LMG reel	≈4.1 kg (on the truss)	LMG 50 ft reel, wt TBD
NJCT 3 USP winch column (scenic truss)	3	14.0 kg	30.9	12/3 × 50' on the LMG reel	≈4.1 kg (on the truss)	LMG 50 ft reel, wt TBD
NJCT 4 US end column (scenic winches)	3	7.5 kg	16.6	12/3 × 50' on the LMG reel	≈4.1 kg (on the truss)	LMG 50 ft reel, wt TBD
NJCT 5 AP1 chain motor (26'0" fixed drop)	2	11.5 kg	25.4	12/3 × 26'	≈2.1 kg (on the motor point)	none
NJCT 6 AP2 chain motor (30'0" fixed drop)	2	12.5 kg	27.6	12/3 × 30'	≈2.4 kg (on the motor point)	none
NJCT 7 AP3 chain motor (28'10" fixed drop)	2	7.4 kg	16.3	12/3 × 28'10"	≈2.4 kg (on the motor point)	none
USR1 / USR2 backdrop winch columns (no injector)	3	4.4 / 4.5 kg	~9.8	none	0	none
All 38 points (incl. pylon heads and AUD anchors)	**14 runs**	**116.0 kg**	**256**	**rope 93.9 kg · 76 rings / 9.5 kg · ~0.2 kg safety per flown point · 7 injector boxes ~8.4 kg each clamped in the truss**		

What this changes vs the winch pass-through

- The Winch 50 has no pass-through, so it is rigging only. Nothing electrical touches the winch or its wire.
- No 48V conversion pod. Deck racks stay 24V (existing PSU racks, ~36 A at 120V mains at full white).
- Four LMG-provided 50 ft cable retractors clamped in the truss, one beside each DS/US winch, all carrying 12/3. Four is the full count for now (winch + power inject only). The three audience APs are chain-motor pickups that fly to trim and stay static, so their drops are fixed cables lashed to the black pickup cable: no retractor.
- One gauge on the winches instead of #8/#12/#10/#14 per position. The fixed AP drops are 12/3 as well, so every drop on the job is one gauge (12/3, decision Aug 31). The trade is voltage drop on the full 50 ft reel at NJCT 1 and 3 (see the table).
- No data on any drop. Data starts at the pylon PXL-CTRL rack and rides the rope itself; the drop is power only.

Open items before ordering

- From LMG on the 50 ft retractors: reel model, conductor count of the 12/3 cable (12/3 vs 12/4), slip ring / reel electrical rating (NJCT 1 runs 26.5 A, NJCT 3 22 A), end terminations, unit weight, and the clamp to the truss chord beside the winch.
- Console: with 12/3 reel cable, set DS and US group master caps around the full-white drop at NJCT 1 (~17.5%) and NJCT 3 (~14.6%); with 12/4 both pairs landed the caps get smaller (~8.8% / ~7.3%).
- Laser-verify the three fixed drops (AP1/AP2/AP3 chain-motor trim heights) and confirm DS/US winch travel stays inside the 50 ft reel.
- Confirm the Winch 50 model / lifting bar on the LMG order so the retractor mount and pickup geometry match.
- Strain relief at the rope end and at the retractor exit; safety on the retractor body. At AP 1/2/3, lashing spec for the fixed drop along the black pickup cable.
- Electrician sign-off: deck mains unchanged, flown side 24V DC on the retractor.