



INDUSTRIAL · CS-590

PICK IT UP SELECTIVELY — CARRY IT ALL AWAY

A tracked, teleoperated manipulator platform for shoreline and land cleanup — reach, load and slope, enforced as one envelope.

POSITION · EXTEND · GRASP · RETRACT · DEPOSIT

PATENT PENDING

RADIO AND GNSS PERMITTED — CIVIL WORK MACHINE

350 KG

GROSS VEHICLE MASS

26.6 °

WORKING SLOPE LIMIT — MID-RANGE SURFACE FRICTION

~4 ×

USABLE-LOAD SWING ACROSS THE REACH-LOAD-SLOPE ENVELOPE

0

ENERGETIC CONTENT OR ENERGETIC CUTTING TOOLS ABOARD

OVERVIEW

THE MANIPULATOR IS THE PLATFORM. EVERYTHING ELSE CARRIES IT THERE.

Part of the 3-system Industrial line — shares its envelope and doctrine with Recovery, Beaver.

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The Enviro is a teleoperated, tracked shoreline and land environmental-cleanup platform: a low, wide chassis carrying a forward-mounted articulated manipulator and a rear swappable bin cassette. It reaches into unstructured debris — timber, tyres, sheeting, netting, contaminated litter — on ground too soft, too steep, too remote or too unpleasant for a conventional machine, and lifts individual objects without disturbing what surrounds them.

It closes the loop Recovery opens. Recovery works the water side of a spill or debris incident; Enviro works the land side — shorelines, riverbanks, contaminated ground — and between them the Industrial line covers both halves of a cleanup that neither Skimmer, nor Washer, nor Rock Scaler was ever scoped to do. Beaver moves bulk material; Enviro's job is the opposite — selective pickup of discrete objects, one at a time, without excavating or dragging.

The machine's real capability is not a single lift number. Reach, load and slope are one coupled constraint, not three independent specs, and usable capacity swings roughly four-to-one across the working envelope. The controller enforces that envelope in software, because an operator concentrating on a grasp cannot also be doing tipover arithmetic — and because the honest value case is measured in person-hours a remediation crew did not spend in a hazardous zone, not in tonnes moved.

THE INVERSION

EVERY OTHER LIFT QUOTES ONE NUMBER. THIS ONE ENFORCES THREE, TOGETHER.

Reach, load and slope trade against each other continuously — the same object is liftable at 2 m on the level and unliftable at 3 m on a bank. Quoting a single capacity figure would misdescribe the platform exactly where it matters most, so the controller carries the envelope instead of the operator.

HOW IT WORKS

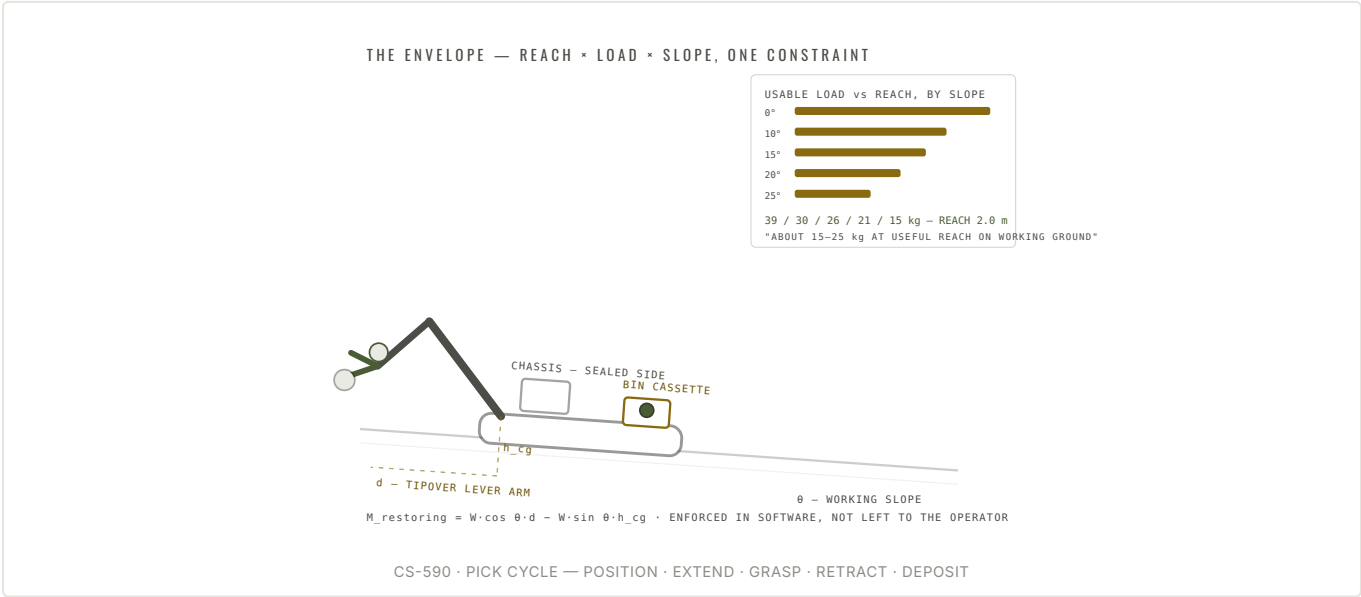
MECHANISM

REACH, LOAD AND SLOPE — ONE ENVELOPE, ENFORCED

Forward tipover about the leading track edge governs the platform's whole capability. On a slope, facing downhill, the restoring moment falls with the cosine of the slope and the tipping moment rises with its sine — so usable load at any given reach is a function of both together, not of either alone.

The arm extends on the quick-change tool interface it shares with Beaver — one estate standard, several heads: a grapple for the general run of unstructured debris, a bucket or scoop for loose aggregate material, a strictly mechanical shear for netting, rope and root mass, and a sampling head for crew-directed work. The grapple is the workhorse, and deliberately so — the correct instinct for wet, tangled, unpredictable shoreline debris is agricultural, not anthropomorphic; a robust jaw that closes on whatever is between it beats a dexterous hand trying to understand the object first.

The governing figure of merit is not a headline lift rating. It is the envelope itself: the controller knows the machine's attitude and the arm's geometry, and refuses commands that would exceed the stability limit — at a factor of safety of 2.0 over the arithmetic tipover point. Facing uphill where the slope allows restores most of the lost envelope for free, a control-and-procedure fix rather than a hardware one. Teleoperation is the baseline mode — camera and force feedback, not a fallback — and the cycle runs the same five beats every time: position, extend, grasp, retract, deposit, with each object dropped into the bin cassette and geotagged into the pick log.



SPECIFICATIONS

CAPABILITIES & SPECIFICATIONS

ENVIRO CS-590

DIMENSIONS & MASS

Configuration	Low, wide tracked chassis · forward manipulator · rear swappable bin cassette
Gross mass	350 kg — deliberately lighter than Beaver; the Enviro needs flotation and stability, not drawbar
Overall width	~1.45 m over the tracks
Track contact	2 × 0.90 m × 0.25 m — 0.45 m ² total
Track gauge	1.2 m between centers — wide on purpose; lateral stability buys manipulator envelope on slope
CG height	0.55 m — the number the design fights hardest to reduce

PERFORMANCE & STABILITY

Ground pressure	~7.6 kPa — inside the 5–15 kPa light tracked soft-ground class
Working slope limit	26.6° class — 21.8°–31.0° by surface; traction-bound, and the machine slides long before it tips
Static lateral tipover	47.5° — never reached in practice; sliding is the earlier, recoverable failure mode
Working speed	0.5 m/s
Stability factor of safety	2.0, applied to the tipover moment

MANIPULATOR & ENVELOPE

Reach	2.0 / 2.5 / 3.0 m — published as an envelope, not a single figure
Usable load	10–39 kg across reach and slope — about 15–25 kg at useful reach on working ground
Envelope swing	~4× — 39 kg at full reach-in on the level down to 10 kg at long reach on a 25° bank
Envelope enforcement	In software — the controller refuses commands beyond the stability limit
End effectors	Grapple (base) · bucket/scoop · mechanical shear · sampling head
Tool interface	Quick-change — shared pattern with Beaver CS-250; one estate standard

CONTROL & NAVIGATION

Control mode	Teleoperation baseline — camera + force feedback, not a fallback · assisted-autonomy transit
Command & telemetry	Commercial RF C2 — permitted on this line, used openly
Navigation	GNSS position — permitted on this surface civil line
Mission record	Per-pick log — geotagged imagery, position and time; a chain-of-custody aid for material that may be regulated
Safety	Software envelope enforcement · bounded speed · visible state · accessible stop — built to work beside a crew

POWER & ENDURANCE

Battery	10 kWh, LFP class — the platform is force- and envelope-limited, not power-limited
Mean electrical draw	~1.5 kW at working speed, with manipulator duty and hotel load
Endurance	~6.7 h

MATERIALS & SERVICEABILITY

Structure	GF-nylon / steel structural frame and arm mount
Sacrificial articles	Recycled-PET covers, belly pan and bin liner — the fleet's recycled-line rules
Bin cassette	Swappable, 4-point seat — the contamination leaves the site with the material
Decontamination	8–12 m ² contaminable surface · 80–180 L regulated effluent per wash cycle — smooth, drainable, no crevice pockets
Self-recovery	Winch + anchor provision — the ground-family pattern
Tooling	Frame and arm-mount moulds cut in Canadian Shield's own 5-axis shop

COMPLIANCE	
Patent status	Patent pending
Line classification	Civil work platform — surface Industrial line; radio and GNSS permitted, used openly
Payload scope	Civil debris and remediation material only — no warhead, no fuze, no energetic content, no energetic cutting tool, in any variant, ever
Regulatory scope	What may lawfully be collected, from where, and how it is handled, transported and disposed of — the site owner, the regulator and counsel, never Canadian Shield and never the machine

NO HEADLINE TONNES-PER-DAY FIGURE IS PUBLISHED — ON THIS MACHINE THAT NUMBER IS NOT A PROPERTY OF THE MACHINE. DAILY COLLECTION IS GOVERNED BY PICK-CYCLE TIME, DUTY CYCLE, MEAN OBJECT MASS AND HOW TANGLED OR BURIED IT IS, GROUND SURFACE, SLOPE AND SEASON, DECONTAMINATION FREQUENCY AND OPERATOR EXPERIENCE. ON OPEN, SAFE, ACCESSIBLE GROUND WITH ORDINARY LITTER, A CREW WITH A TRUCK IS VERY PROBABLY FASTER AND CHEAPER — AND THE HONEST RECOMMENDATION IS TO USE ONE; THE ENVIRO'S CASE IS THE GROUND WHERE THAT IS NOT TRUE.

THE TRADES, STATED

THE LAND HALF OF A JOB RECOVERY CAN'T FINISH ALONE.

Canadian Shield's thesis is that manufacturing is the decisive capability. Enviro is that thesis pointed at cleanup and remediation: the same sovereign Canadian production base, the same materials canon, doing land-side work no existing platform in the fleet was ever scoped to do.

The overlap is physical, not rhetorical. The 5-axis shop that cuts structural moulds for the rest of the fleet cuts Enviro's frame and arm-mount tooling; the sacrificial rPET covers, belly pan and bin liner run on the same recycled-line rules as every other platform's non-structural parts — and Enviro needs more of them than any other machine in the line, because a cleanup vehicle that cannot be washed is a liability, not an asset. The quick-change tool interface is deliberately shared with Beaver (CS-250): one estate standard, not two.

And up here, the estate's radio boundary runs the civil way. The no-radio rule governs the defence, underground and tethered platforms without exception — but the Industrial line is the surface civil exception where radio and GNSS are permitted, and Enviro depends on both openly: teleoperation is the baseline control mode and needs a live commercial radio link with camera and force feedback, and GNSS geotags every pick into the chain-of-custody record. A contaminated riverbank is not a jammed battlefield, and we do not price it like one.

DEPLOYMENT

REACH IN. PICK SELECTIVELY. CARRY IT ALL AWAY.

An Enviro job is a loop, not a shift: the site is tasked, the crew works the envelope, and what leaves is the machine, the reusable articles, and a record of exactly what was collected — never the contamination. Here is the day, end to end — illustrative of the operating loop, not a job record.

THE REAL PRODUCT

THE TONNAGE ISN'T THE PITCH. THE EXPOSURE-HOURS AVOIDED ARE.

Against an open, accessible site and a crew with rakes and a truck, Enviro is not obviously the faster or cheaper answer, and we say so plainly. Its case is the ground where sending a person is the wrong call — and the honest measure is how many hours inside a hazardous zone a crew never had to spend, not how many kilograms the machine carried.

01 · ARRIVE

THE SITE IS TASKED

The crew arrives with the machine, a clean bin cassette and the decon station. On a shoreline incident the tasking picture is shared with Recovery on the water side — Enviro works the land, and the tide line is the handoff. The operator sets up the teleoperation station clear of the hot zone; material classification and site access are the site owner's and the regulator's call — never ours — and crew lanes and exclusion zones are set before the arm moves.

02 · WORK

THE ARM WORKS THE ENVELOPE

The operator drives into position — facing uphill where the slope allows, which restores most of the lost envelope for free — extends the arm, and grasps. The controller checks every command against the reach-load-slope envelope before it commits; each pick is geotagged and logged, and the bin fills. The operator directs the grasp, watches the machine and owns the exceptions; the machine stays inside the envelope, and proves what it picked up.

03 · RECOVER

THE BIN LEAVES. THE MACHINE GETS CLEAN.

The full cassette swaps for a clean one at the 4-point seat — the contaminated volume leaves the site with the material, not attached to the machine. The vehicle then runs the wash cycle at the decon station; effluent is captured, not discharged, and the client gets the pick-by-pick record. What leaves is the machine, clean, and every reusable article; what goes for disposal is the bin cassette, manifested, and the wash effluent.

THE FAMILY

RELATED SYSTEMS

CS-580 · WATER SIDE

RECOVERY

The water half of the same incident — Enviro closes the loop Recovery opens, at the tide line.

CS-250 · GROUND FAMILY

BEAVER

Moves bulk material — the opposite job — and shares the quick-change tool interface: one estate standard, not two.

Enviro CS-590 · patent pending · a civil work platform on the surface Industrial line, where radio and GNSS are permitted and used openly. Carrier of civil debris and remediation material — no warhead, no fuze, no energetic content and no energetic cutting tool, in any variant, ever. What may lawfully be collected, from where, and how it must be handled, transported and disposed of belongs to the site owner, the regulator and counsel — never to Canadian Shield, and never to the machine.



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The tonnage isn't the pitch. The exposure-hours avoided are.

01

REQUEST A TECHNICAL EXCHANGE

A working session with engineering, not sales — bring your engagement problem, we bring the mechanism.

02

REQUEST THE INDUSTRIAL FAMILY DATA PACK

Drawings, tolerances and test basis for Enviro and its siblings, gated behind export screening.

03

DISCUSS A TRIAL QUANTITY

Tell us end-user, jurisdiction, quantity band and timeline — we respond against your program, not a price list.

SALES

sales@cdnshield.ca

GENERAL

info@cdnshield.ca

WEB

cdnshield.ca

Direct lines, named points of contact and facility details are shared with qualified programs following screening — not withheld, sequenced.

Canadian Shield is a defence and industrial drone company, backed by SIG: four-domain uncrewed systems built for jammed, GPS-denied environments — no-radio by design, manufactured for cost and salvo depth.

Enviro CS-590

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