

Part review packet — J1-post-enclosure-bracket

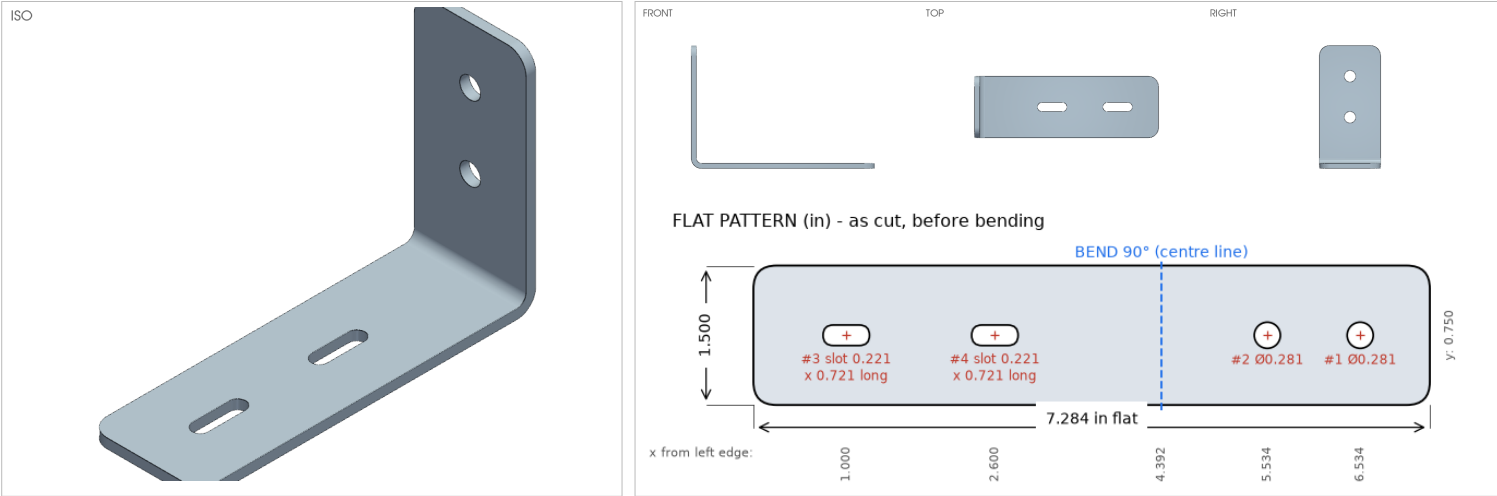
PE-REVIEW

North Idaho AI & Operations · part-harness v0.1 prototype · generated 2026-10-18 19:33 PT · machine time 1.4 s
Request: "Need a pair of brackets to set a 8x6x4 inch plastic controller box (well-pump controller, about 6 lb loaded) off the side of a 4x4 wood post in my barn. Lag screws into the post, box screws down onto the brackets. Aluminum so it doesn't rust."

READY FOR PE REVIEW

Triage: spec says load_bearing = true; customer-stated load 6 lbf; keyword 'shelf' suggests mounting under load

Part family	I_bracket	Process / fabricator	laser_sheet / sendcutsend
Material	5052 H32 Aluminum 0.125 in (ALU-125)	Finish	deburring
Quantity	2	Intended use	Pair of shelf-style brackets that carry a 6 lb controller enclosure off a vertical wood post; enclosure screws to the horizontal legs.
Environment	indoor barn, unheated, dusty, occasional bumps	Load (customer-stated)	6 lbf



Key dimensions (spec / measured)

Base leg (outside)	4.5 in / 4.500
Upright leg (outside)	3.0 in / 3.000
Width	1.5 in / 1.500
Thickness / inside bend R	0.125 / 0.125 in (SCS)
Flat length (SCS bend deduction)	7.284 in
Holes	4 (#10, 1/4)

Stress sanity (ESTIMATE, PASS): ESTIMATE ONLY. Each bracket as a cantilever plate fixed at the bend: $P = 6 \text{ lbf} \times 2.0$ (dynamic factor, assumed) / 2 brackets = 6.0 lbf at $e = 2.25 \text{ in}$. $M = 13.5 \text{ in-lbf}$; net width 1.28 in (largest base hole removed), $t = 0.125 \text{ in}$; $\sigma = 6M/(b t^2) = 4.1 \text{ ksi}$ vs yield 26.0 ksi (SCS spec) -> SF 6.4. Tip deflection ~0.011 in. Ignores bend-zone stress concentration, fatigue, fastener pull-out, post strength.

Files bound to this decision

STEP: J1-post-enclosure-bracket.step · sha256 3f7cd34d09176d60
STL: J1-post-enclosure-bracket.stl · sha256 5104d6a5a9988970
DXF: J1-post-enclosure-bracket_flat.dxf · sha256 108d32b2c6af5e8a

Automated checks (full numbers on page 2 appendix)

G1	PASS	BRep valid, single solid	M6b	PASS	Loaded holes: centre-to-edge $\geq 1.5 \text{ d}$
G2	PASS	STL watertight / manifold	M7	PASS	Web between holes $\geq \max(\text{SCS min bridge}, 1.0 \text{ t})$
G3	PASS	STEP round-trip	M8	PASS	Clearance hole fits stated fastener
G4	PASS	Overall envelope matches spec	B1	PASS	Flange lengths $\geq \text{SCS min flange (after bend)}$
G5	PASS	Every hole/slot at spec position and size ($\pm 0.25 \text{ mm}$)	B2	PASS	Bend angle and length within SCS limits
M1	PASS	SKU in catalog and in stock	B3	PASS	Hole edge to bend tangent $\geq 2 \text{ t}$
M2	PASS	Required services offered for this SKU	B4	PASS	Bend relief
M3	PASS	Flat size within fabricator limits	B5	PASS	Flat pattern: SCS bend deduction vs SCS k-factor agree
M4	PASS	Hole dia $\geq \text{SCS min hole size}$	D1	PASS	DXF flat pattern re-read
M5	PASS	Hole dia $\geq \text{material thickness}$	S1	PASS	Stress sanity estimate SF on yield ≥ 3
M6	PASS	Hole edge to part edge $\geq \max(\text{SCS min}, 1.0 \text{ t})$			

Open questions for reviewer

- Lag screw size/embedment into the post is NOT checked by the harness (customer supplies 1/4 in lags). OK to leave to customer?
- Electrical: bracket only; the controller install itself is the customer's/electrician's responsibility. Disclaimer wording OK?
- Stress box is a hand estimate with an assumed dynamic factor and equal load share; confirm or replace.

Reviewer decision (PE)

☐ APPROVE as drawn	☐ APPROVE with changes (note below)	☐ REJECT
Notes:		
Reviewer:	License # / state:	Date:
Decision applies only to the exact files whose hashes are listed above. Scope of this review (design check vs. stamped work) is an open question for Ben and the reviewer — see README.		

Appendix — check details (J1-post-enclosure-bracket)

#	Check	Result	Detail	Source
G1	BRep valid, single solid	PASS	is_valid=True, solids=1	geometry
G2	STL watertight / manifold	PASS	watertight=True, winding_ok=True, 2836 tris, vol diff vs BRep 0.002%	geometry
G3	STEP round-trip	PASS	re-imported volume diff 0.0000%	geometry
G4	Overall envelope matches spec	PASS	X/Y/Z mm got 114.30/38.10/76.20 want 114.30/38.10/76.20 (tol 0.25 mm)	geometry
G5	Every hole/slot at spec position and size (±0.25 mm)	PASS	4 features, 40 probe points, all OK	geometry
M1	SKU in catalog and in stock	PASS	ALU-125 = 5052 H32 Aluminum 0.125 in, Fiber Laser, out_of_stock=False	SCS spec
M2	Required services offered for this SKU	PASS	needs ['bending', 'deburring']: all offered	SCS spec
M3	Flat size within fabricator limits	PASS	flat 7.284 in x 1.500 in; allowed 1.5x0.375 to 44x30 in	SCS spec
M4	Hole dia >= SCS min hole size	PASS	smallest 0.221 in vs SCS min 0.044 in	SCS spec
M5	Hole dia >= material thickness	PASS	smallest 0.221 in vs t 0.125 in	rule
M6	Hole edge to part edge >= max(SCS min, 1.0 t)	PASS	worst hole #1: 0.609 in; SCS min 0.038 in, 1.0 t = 0.125 in	SCS spec + rule
M6b	Loaded holes: centre-to-edge >= 1.5 d	PASS	worst hole #1: 2.67 d	rule
M7	Web between holes >= max(SCS min bridge, 1.0 t)	PASS	holes #1-#2: 0.719 in vs 0.125 in	SCS spec + rule
M8	Clearance hole fits stated fastener	PASS	#1 1/4 ok; #2 1/4 ok; #3 #10 ok; #4 #10 ok (table: ASME B18.2.8 as recalled, verify)	rule
B1	Flange lengths >= SCS min flange (after bend)	PASS	legs 4.500 in / 3.000 in vs min 0.476 in	SCS spec
B2	Bend angle and length within SCS limits	PASS	90 deg (max 130.0), bend length 1.500 in (max 44 in)	SCS spec
B3	Hole edge to bend tangent >= 2 t	PASS	closest 0.859 in vs 2t = 0.250 in (SCS tapped-hole CL-to-bend ref: 0.517 in)	rule
B4	Bend relief	PASS	bend runs full width edge-to-edge; no partial bend, so no relief cut needed	geometry
B5	Flat pattern: SCS bend deduction vs SCS k-factor agree	PASS	BA from BD 0.284 in, from k=0.44 0.283 in, diff 0.001 in. Flat length 7.284 in. SCS re-derives flat from STEP anyway.	SCS spec
D1	DXF flat pattern re-read	PASS	\$INSUNITS=1 (want 1), CUT entities 5, BEND lines 1, splines 0, extents 7.284 x 1.500	geometry
S1	Stress sanity estimate SF on yield >= 3	PASS	SF ~6.4, defl ~0.011 in (estimate, see box below)	estimate

Sources: geometry = measured from generated BRep/STL/DXF; SCS spec = SendCutSend published LLM spec JSON for this SKU; rule = harness rule of thumb (conservative default, not a fabricator number); estimate = hand calc for reviewer context only.