



VEYRUM ROBOTICS STANDARD



VRS-FLD-501

Field & Outdoor — AR Rubric Data Twin

Machine-readable criteria, tier ceilings, contributors and bands of VRS-FLD-201 (VRS 2026 (draft)); generated, never hand-edited.

VEYRUM RESEARCH INSTITUTE

DOCUMENT

VRS-FLD-501

VERSION

1.0.0

STATUS

Draft

DATE

16 September 2026

Foreword. Data Artifact: the machine-readable twin of **VRS-FLD-201** (VRS 2026 (draft)) — the sector criteria with their point ranges, rungs and tier ceilings, the contributing intrinsic criteria, the letter bands and the application classes — generated FROM the protocol's Clause 5–7 by `tools/vrs-twin-generate.py`. Consistency is by construction and re-verified on every build (conformance check 15). The JSON in Clause 4 is the normative payload; scorer tooling consumes it directly. A change to VRS-FLD-201 and to this twin is one change instrument.

1 Scope

This Data Artifact carries the rubric data of the Field & Outdoor (FLD) sector in machine-readable form: the 9 sector criteria of VRS-FLD-201 Clause 6 with points, rungs and Unverified / Verified / Certified ceilings; the contributing intrinsic criteria of Clause 5; the letter bands and application classes of Clause 7. It states no independent requirements. Where this artifact and VRS-FLD-201 could be read to differ, VRS-FLD-201 governs and this twin is regenerated to match.

2 Normative references

- **VRS-FLD-201**, *Field & Outdoor — AR Assessment Protocol* — source protocol twinned (Clauses 5–7).
- **VRS-FLD-001**, *Field & Outdoor — Sector Standard* — application classes and hazard groups.
- **VRS-GEN-005**, *IR Methodology* — point sum, tier ceilings, no-evidence rule.
- **VRS-GEN-006**, *AR Scheme* — pool mechanics, letter bands, tier caps by construction.
- **VRS-GEN-002**, *Designation and Drafting Rules* — criterion layout (§6.5) and versioning.

3 Terms and definitions

The terms of VRS-GEN-001 and VRS-FLD-201 apply. **data twin** — a machine-readable artifact regenerated one-to-one from a source protocol's normative clauses. **rung** — a named state of a criterion awarding a stated integer number of points (VRS-GEN-002 §3.9). **ceiling** — the maximum points a criterion awards at a stated tier (VRS-GEN-002 §3.10).

4 Payload

Sector criteria total **100** points; ceilings Unverified **70**, Verified **85**, Certified **100**.

```
{
  "_meta": {
    "description": "FLD sector AR rubric data twin – machine-readable form of VRS-FLD-201 Clause 5/6/7 (VRS 2026 (draft)). Generated by tools",
    "edition": "VRS 2026 (draft)",
    "source_protocol": "VRS-FLD-201 v1.0.0",
    "generated": "2026-09-16",
    "conforms_to": "VRS-GEN-005 §6 (point sum, tier ceilings); VRS-GEN-006 §6–§8 (pool, bands, tier caps by construction)"
  },
  "sector_code": "fld",
  "bands_percent": {
    "AAA": 90,
    "AA": 75,
    "A": 60,
    "B": 45,
    "C": 0
  },
  "application_classes": [
    "agricultural",
    "construction/earthmoving",
    "mining",
    "inspection/survey (legged, wheeled, tracked)"
  ],
  "contributing_ir_criteria": [
    {
      "id": "SF-1",
      "document": "VRS-GEN-101",
      "clause": "6.1"
    },
    {
      "id": "SF-2",
      "document": "VRS-GEN-101",
      "clause": "6.2"
    }
  ]
}
```

```

    "id": "SF-4",
    "document": "VRS-GEN-101",
    "clause": "6.4"
  },
  {
    "id": "SF-5",
    "document": "VRS-GEN-101",
    "clause": "6.5"
  },
  {
    "id": "SF-6",
    "document": "VRS-GEN-101",
    "clause": "6.6"
  },
  {
    "id": "SF-8",
    "document": "VRS-GEN-101",
    "clause": "6.8"
  },
  {
    "id": "RL-2",
    "document": "VRS-GEN-102",
    "clause": "6.2"
  },
  {
    "id": "RL-3",
    "document": "VRS-GEN-102",
    "clause": "6.3"
  },
  {
    "id": "SV-1",
    "document": "VRS-GEN-103",
    "clause": "6.1"
  },
  {
    "id": "SV-5",
    "document": "VRS-GEN-103",
    "clause": "6.5"
  },
  {
    "id": "SV-6",
    "document": "VRS-GEN-103",
    "clause": "6.6"
  },
  {
    "id": "CY-3",
    "document": "VRS-GEN-105",
    "clause": "6.3"
  },
  {
    "id": "CY-4",
    "document": "VRS-GEN-105",
    "clause": "6.4"
  },
  {
    "id": "MS-1",
    "document": "VRS-GEN-106",
    "clause": "6.1"
  },
  {
    "id": "MS-7",
    "document": "VRS-GEN-106",
    "clause": "6.7"
  },
  {
    "id": "SI-2",
    "document": "VRS-GEN-104",
    "clause": "6.2"
  }

```

```

    },
    {
      "id": "SI-6",
      "document": "VRS-GEN-104",
      "clause": "6.5"
    }
  ],
  "sector_criteria": [
    {
      "clause": "6.1",
      "id": "FLD-1",
      "name": "Anchor conformity (ISO 18497 / 17757 / 3691-4 / 12100 by class)",
      "points_max": 14,
      "what_is_measured": ".",
      "rungs": [
        {
          "points": 14,
          "state": "third-party-assessed + validated at envelope"
        },
        {
          "points": 12,
          "state": "evidenced by documents alone (public or pack), not demonstrated"
        },
        {
          "points": 11,
          "state": "third-party-assessed conformity ((public certificate))"
        },
        {
          "points": 9,
          "state": "self-declared + internal validation"
        },
        {
          "points": 5,
          "state": "declaration only"
        },
        {
          "points": 0,
          "state": "not established. · 0. Legged/other without a recognised anchor: ISO 12100 + functional-safety evidence on the same rungs"
        }
      ],
      "ceiling": {
        "unverified": 12,
        "verified": 12,
        "certified": 14
      },
      "company_wide": null,
      "evidence_bar": "Declaration for the rated version.",
      "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
      "not_applicable_by_class": false
    },
    {
      "clause": "6.2",
      "id": "FLD-2",
      "name": "Person-in-zone detection and stop at speed and load",
      "points_max": 14,
      "what_is_measured": "Detection/stop of a human-sized test target entering the zone at declared max speed and load, on declared worst te",
      "rungs": [
        {
          "points": 14,
          "state": "witnessed at limits"
        },
        {
          "points": 12,
          "state": "pack-evidenced (documents), not demonstrated"
        },
        {
          "points": 10,
          "state": "nominal witnessed"
        }
      ]
    }
  ]
}

```

```

    },
    {
      "points": 8,
      "state": "certified with published data"
    },
    {
      "points": 5,
      "state": "validation report"
    },
    {
      "points": 0,
      "state": "not established"
    }
  ],
  "ceiling": {
    "unverified": 8,
    "verified": 12,
    "certified": 14
  },
  "company_wide": null,
  "evidence_bar": "Envelope declared.",
  "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
  "not_applicable_by_class": false
},
{
  "clause": "6.3",
  "id": "FLD-3",
  "name": "Zone-boundary (geofence) enforcement and excursion behaviour",
  "points_max": 12,
  "what_is_measured": "Robot never crosses a configured boundary; on boundary-system fault → declared stop.",
  "rungs": [
    {
      "points": 12,
      "state": "witnessed incl. GNSS-degraded case"
    },
    {
      "points": 10,
      "state": "pack-evidenced (documents), not demonstrated"
    },
    {
      "points": 8,
      "state": "witnessed nominal"
    },
    {
      "points": 6,
      "state": "documented + tested"
    },
    {
      "points": 3,
      "state": "documented"
    },
    {
      "points": 0,
      "state": "not established"
    }
  ],
  "ceiling": {
    "unverified": 6,
    "verified": 10,
    "certified": 12
  },
  "company_wide": null,
  "evidence_bar": "Boundary system declared.",
  "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
  "not_applicable_by_class": false
},
{
  "clause": "6.4",

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```

    "id": "FLD-4",
    "name": "Slope, rollover and terrain stability at limits",
    "points_max": 12,
    "what_is_measured": "No rollover at declared max slope/side-slope with declared load; behaviour on soft ground.",
    "rungs": [
      {
        "points": 12,
        "state": "witnessed"
      },
      {
        "points": 9,
        "state": "pack-evidenced (documents), not demonstrated"
      },
      {
        "points": 8,
        "state": "certified/tested ((public))"
      },
      {
        "points": 6,
        "state": "validation report"
      },
      {
        "points": 3,
        "state": "documented"
      },
      {
        "points": 0,
        "state": "not established"
      }
    ],
    "ceiling": {
      "unverified": 8,
      "verified": 9,
      "certified": 12
    },
    "company_wide": null,
    "evidence_bar": "Slope limits declared.",
    "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
    "not_applicable_by_class": false
  },
  {
    "clause": "6.5",
    "id": "FLD-5",
    "name": "Weather-degraded perception and fail-safe",
    "points_max": 10,
    "what_is_measured": "Behaviour under declared rain/dust/low-light/glare limits: declared safe state entered.",
    "rungs": [
      {
        "points": 10,
        "state": "witnessed declared conditions"
      },
      {
        "points": 9,
        "state": "pack-evidenced (documents), not demonstrated"
      },
      {
        "points": 7,
        "state": "documented + independently tested"
      },
      {
        "points": 3,
        "state": "documented"
      },
      {
        "points": 0,
        "state": "not established"
      }
    ]
  },

```

```

    "ceiling": {
      "unverified": 7,
      "verified": 9,
      "certified": 10
    },
    "company_wide": null,
    "evidence_bar": "Weather envelope declared.",
    "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
    "not_applicable_by_class": false
  },
  {
    "clause": "6.6",
    "id": "FLD-6",
    "name": "Implement and stored-energy hazards during service",
    "points_max": 8,
    "what_is_measured": "Implement lock-out, hydraulic/stored-energy isolation, service-position interlocks.",
    "rungs": [
      {
        "points": 8,
        "state": "witnessed"
      },
      {
        "points": 7,
        "state": "pack-evidenced (documents), not demonstrated"
      },
      {
        "points": 6,
        "state": "certified/documented in detail"
      },
      {
        "points": 3,
        "state": "documented"
      },
      {
        "points": 0,
        "state": "not established. · 0. Applies where an implement/hydraulic system exists"
      }
    ],
    "ceiling": {
      "unverified": 6,
      "verified": 7,
      "certified": 8
    },
    "company_wide": null,
    "evidence_bar": "Applies where implements/hydraulics exist.",
    "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
    "not_applicable_by_class": false
  },
  {
    "clause": "6.7",
    "id": "FLD-7",
    "name": "Remote-site recovery and serviceability",
    "points_max": 10,
    "what_is_measured": "Field-repairable modules, recovery procedure for a stranded unit, parts logistics for remote sites, seasonal-peak",
    "rungs": [
      {
        "points": 10,
        "state": "witnessed swap + commitments + record"
      },
      {
        "points": 8,
        "state": "commitments + record"
      },
      {
        "points": 7,
        "state": "company-wide record in place of model-specific data"
      }
    ]
  }

```

```

      "points": 4,
      "state": "documented"
    },
    {
      "points": 0,
      "state": "not established"
    }
  ],
  "ceiling": {
    "unverified": 8,
    "verified": 8,
    "certified": 10
  },
  "company_wide": {
    "text": "Record company-wide → 7",
    "ceiling": 7
  },
  "evidence_bar": "None.",
  "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
  "not_applicable_by_class": false
},
{
  "clause": "6.8",
  "id": "FLD-8",
  "name": "Link, GNSS and tele-operation integrity",
  "points_max": 12,
  "what_is_measured": "Lost-link fail-safe; GNSS spoofing/jamming resilience or safe degradation; tele-op authentication.",
  "rungs": [
    {
      "points": 12,
      "state": "witnessed lost-link + spoof/jam degradation"
    },
    {
      "points": 10,
      "state": "pack-evidenced (documents), not demonstrated"
    },
    {
      "points": 9,
      "state": "documented in detail + public audit"
    },
    {
      "points": 6,
      "state": "documented"
    },
    {
      "points": 3,
      "state": "partial"
    },
    {
      "points": 0,
      "state": "not established"
    }
  ],
  "ceiling": {
    "unverified": 9,
    "verified": 10,
    "certified": 12
  },
  "company_wide": null,
  "evidence_bar": "Link and positioning architecture declared.",
  "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
  "not_applicable_by_class": false
},
{
  "clause": "6.9",
  "id": "FLD-9",
  "name": "Field-context incident record",
  "points_max": 8,

```

```

    "what_is_measured": "Incidents in field deployments over the window.",
    "rungs": [
      {
        "points": 8,
        "state": "none above near-miss (model)"
      },
      {
        "points": 6,
        "state": "null-result rung with company-wide exposure"
      },
      {
        "points": 5,
        "state": "remediated"
      },
      {
        "points": 0,
        "state": "unremediated major"
      }
    ],
    "ceiling": {
      "unverified": 6,
      "verified": 8,
      "certified": 8
    },
    "company_wide": {
      "text": "Company-wide → 6",
      "ceiling": 6
    },
    "evidence_bar": "Exposure or null search.",
    "applicability": "agricultural · construction/earthmoving · mining · inspection/survey (legged, wheeled, tracked). All criteria apply t",
    "not_applicable_by_class": false
  }
],
  "pool": {
    "sector_only": {
      "points": 100,
      "ceiling_unverified": 70,
      "ceiling_verified": 85,
      "ceiling_certified": 100,
      "best_letter": {
        "unverified": "A",
        "verified": "AA",
        "certified": "AAA"
      }
    },
    "with_contributors": "contributor ceilings are those of the cited IR standards; the combined pool sums are verified by the conformance ga",
    "rules": {
      "no_evidence": "0 points (VRS-GEN-005 §6, R3.3); the criterion stays in the pool at full range",
      "not_applicable": "criterion removed from numerator and denominator for that class (VRS-GEN-006 §6)",
      "tier_rule": "AR tier ≤ IR tier (VRS-GEN-006 §7)"
    }
  }
}

```

5 Field dictionary

FIELD	MEANING
<code>sector_criteria[].clause</code>	VRS-FLD-201 subclause (6.k) — the “Required by” reference used in derived packs and protocols
<code>sector_criteria[].points_max</code>	Upper end of the criterion's integer range
<code>sector_criteria[].rungs[]</code>	Every verifiable state and its points, highest first; the 0 state is implicit where not listed
<code>sector_criteria[].ceiling</code>	Maximum points at each tier; always equal to a rung value (VRS-GEN-002 §7.5.1)
<code>sector_criteria[].company_wide</code>	Field-record criteria only: the reduced ceiling when company-wide data substitutes for model data
<code>sector_criteria[].applicability / not_applicable_by_class</code>	Application classes the criterion applies to; excluded criteria leave the pool for that class
<code>contributing_ir_criteria[]</code>	Intrinsic criteria counted in the sector pool, with the standard and clause that score them
<code>pool.sector_only</code>	Sums over the sector criteria and the best attainable letter at each tier (A / AA / AAA by construction)
<code>bands_percent</code>	Letter thresholds as a percentage of the applicable pool (VRS-GEN-006 §4)

6 Verification

Regenerate with `python3 tools/vrs-twin-generate.py --sector fld --check`; a non-zero exit means the committed twin no longer matches VRS-FLD-201 and shall be regenerated before publication.

7 Bibliography

- VRS-FLD-201, *Field & Outdoor — AR Assessment Protocol*, v1.0.0, 2026 — the source of every number in Clause 4.
- VRS-FLD-001, *FLD Sector Standard*, 2026 — sector scope, hazard taxonomy and application classes.
- VRS-GEN-005, *Intrinsic Rating — Methodology*, 2026 — point aggregation and tier ceilings for the contributing IR criteria.
- VRS-GEN-006, *Application Rating Scheme*, 2026 — letter bands and pool mechanics reproduced in `bands_percent` and `pool`.
- VRS-GEN-002, *Designation and Drafting Rules*, 2026 — §6.5 criterion layout and §7.5.1 (ceilings equal rungs) that this twin verifies.
- VRS-GEN-004, *Change, Edition and Review Policy*, 2026 — how a twin regeneration is designated.
- VRS-GEN-009, *Robot Risk Passport and Registry — Data Schema*, 2026 — consumer of the payload.
- ISO/IEC 21778:2017, *Information technology — The JSON data interchange syntax*.

8 Change history

VERSION	DATE	CHANGE
1.0.0 (draft)	2026-09-16	VRS 2026 (draft) rewrite: regenerated from VRS-FLD-201 Clause 5–7 (criteria, rungs, tier ceilings, contributors, bands, classes). Weights, modifiers, confidence and stage- prior fields removed.

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