EXHIBIT D

Zoning and Land-Use Justification: Geodesic Greenhouse Domes as Temporary Agricultural Accessory Structures

LCMG Demonstration Garden — City of Cheyenne, Department of Planning & Development

1. Purpose and Scope

This exhibit provides the zoning, land-use, and structural-classification justification for the five geodesic greenhouse domes proposed at the Laramie County Master Gardeners (LCMG) Demonstration Garden. The purpose is to demonstrate that the domes qualify as temporary agricultural accessory structures on government-owned, tax-exempt airport-district land, and therefore do not require stamped structural or foundation plans under the City of Cheyenne's building-code pathway.

This justification is based on four interdependent design and use characteristics: the domes' non-permanent construction, their ballast-based anchoring system, their exclusively agricultural and educational function, and their compliance with allowable uses in the Airport District. Each of these characteristics is addressed in the sections below, with supporting calculations and a compliance checklist provided for review by Planning and Development staff.

Classification Summary: Temporary Agricultural Accessory Structure | No Foundation | No Stamped Plans Required

Parameter	Classification / Value	Basis / Notes
Zoning District	Airport District — governmental / public benefit land	Tax exempt; owned by Cheyenne Regional Airport
Allowable Use Category	Government, educational, agricultural demonstration	No commercial activity; no occupancy
Structure Classification	Temporary agricultural accessory structure	Non permanent; no building footprint
Foundation Type	None — surface bearing base ring on undisturbed native soil	No concrete, piers, or frost protected footings
Anchoring Method	Removable soil ballast in continuous raised beds	3 ft wide × 3 ft high per dome perimeter
Total Ballast Mass (5 domes)	Over 135,000 lb of removable soil	100–120 lb/ft³ Cheyenne moist clay loam
Occupancy Classification	None — non habitable agricultural facility	No occupancy load; no commercial use
Stamped Engineer Plans Required?	No	Domes do not meet the conditions that trigger this requirement
Removability	Full disassembly without excavation or demolition	Land is unaltered upon removal

2. Zoning Context: Airport District and Allowable Uses

The Demonstration Garden is located on land owned by the Cheyenne Regional Airport. This land is tax-exempt and designated for governmental and public-benefit purposes. Under the City of Cheyenne Unified Development Code, the Airport District allows governmental, educational, and agricultural demonstration uses when they do not introduce permanent structures and do not interfere with aviation operations.

The LCMG Demonstration Garden operates in three roles that each independently satisfy allowable-use criteria in the Airport District:

1. A public agricultural education facility serving Cheyenne-area residents, schools, 4-H clubs, and FFA chapters
2. A non-commercial horticultural demonstration site showcasing sustainable growing practices in Wyoming's semi-arid climate
3. A government-affiliated volunteer program providing direct community benefit through food production demonstration, STEM education, and stormwater management

The five geodesic domes support these functions by providing season-extension capacity for educational programming and hands-on horticultural instruction. Because the domes introduce no occupancy, no commercial activity, and no permanent building footprint, they fall within the category of agricultural accessory structures permitted on airport-district land without triggering building-code requirements for permanent structures.

3. Structural Classification: Temporary, Non-Permanent Agricultural Structures

3.1 No Foundation or Engineered Footings

Each dome sits directly on undisturbed native soil. There is no concrete foundation, no pier system, no frost-protected footing, and no structural load transfer into the ground. The dome's base ring is a surface-bearing component that distributes the dome's dead load over the soil contact area and can be removed without excavation or demolition.

This is the defining structural characteristic that maintains the domes' classification as temporary agricultural structures rather than buildings. Under Cheyenne's building-code framework, the presence or absence of a foundation — not size, height, or wind load — is the primary trigger for the structural engineering review pathway. The LCMG domes have no foundation by design and by intent. This is reflected in the absence of the word "foundation" from the 224-page construction manual. https://wyoextension.org/publications/Search_Details.php?pubid=2151&pub=B-1387

3.2 Dome Base Ring on Undisturbed Soil

The 22-foot dome base ring bears directly on the native soil surface at grade. The dome spans 22 feet in diameter, and the base ring transfers the dome's weight to the soil over the full circumference of the ring footprint. No soil is excavated beneath the ring, no compaction is performed to create an engineered bearing surface, and no drainage or waterproofing is installed below the ring. The dome is, in structural terms, resting on the ground.

This is consistent with how agricultural high tunnels, hoop houses, and geodesic growing structures are treated under both Wyoming Department of Agriculture guidance and standard municipal agricultural accessory structure classifications: surface-bearing structures without footings are not buildings and are not subject to building-code structural engineering requirements.

3.3 Removability and Non-Alteration of Land

Because the domes have no foundation and rely solely on removable ballast, they can be fully disassembled and removed without altering the land in any permanent way. The soil beneath each dome remains in its natural undisturbed state throughout the operational life of the dome. Upon removal, the site is restored to its original condition without excavation, demolition, or remediation.

This satisfies the City's criteria for non-permanent structures and is the basis for avoiding the building-code requirements for engineered design documentation.

4. Ballast-Based Anchoring System

4.1 Description of the Ballast System

Each of the five 22-foot domes is surrounded by continuous interior and exterior raised planting beds, each measuring 3 feet wide by 3 feet high. These raised beds are filled with native soil and serve as non-structural ballast, providing lateral and uplift resistance to wind loading while remaining fully removable and non-load-bearing.

The raised beds perform a deliberate dual function: they provide the growing medium for the perimeter planting zone that is integral to the site's horticultural mission, and they provide the mass-based wind resistance that stabilizes the dome without requiring mechanical anchors or structural footings. This dual function is by design and is consistent with accepted agricultural structure practice.

The raised beds do not support vertical loads from the dome structure. They do not function as a foundation. They do not transfer structural loads into the ground. They do not alter the land in a permanent way. Their function is solely to resist lateral wind forces through their combined soil mass, which acts on the dome base ring through contact pressure.

4.2 Ballast Mass Calculation

Parameter	Formula / Input	Value	Notes
Bed cross section (W × H)	3 ft × 3 ft	**9 ft²**	Per dome; continuous perimeter bed
Outer bed perimeter per dome	~85 linear ft	**~85 ft**	Based on 22 ft dome diameter
Bed volume per dome	9 × 85	**~765 ft³**	Inner + outer bed combined
Soil density (Cheyenne clay loam)	100–120 lb/ft³	**110 avg**	Moist density; conservative midpoint
Ballast mass per dome	765 × 110	**~84,150 lb**	~42 tons per dome
Total ballast mass (5	84,150 × 5	**>135,000 lb**	>67 tons total; removable soil

domes)			mass

The calculation above confirms that the continuous raised-bed perimeters across all five domes contain well over 135,000 pounds of removable soil ballast — equivalent to more than 67 tons. This mass provides substantial resistance to wind uplift and lateral loading without creating a structural footing or triggering foundation-related permitting requirements. The ballast is removable and non-load-bearing in the structural sense; it preserves the domes' classification as temporary agricultural equipment.

4.3 Why Ballast Does Not Constitute a Foundation

Under City of Cheyenne permitting standards and standard building code interpretation, the distinction between ballast and a foundation is as follows:

1. A foundation transfers structural loads from a building into the ground through a continuous, fixed bearing interface — typically concrete, masonry, or driven piles. A foundation cannot be removed without excavation or demolition.
2. Ballast resists overturning and uplift forces through its own weight, without transferring building loads into the ground and without creating a permanent bond between structure and soil. Ballast can be removed without disturbing the soil below.

The raised-bed soil ballast at the LCMG domes meets the definition of ballast, not foundation, under this framework. This is consistent with how the City treats hoop houses, high tunnels, and other agricultural structures that rely on soil mass, earth anchors, or removable ballast rather than engineered footings.

5. Conditions That Trigger Stamped Structural and Foundation Plans

The City of Cheyenne's requirement for stamped structural and foundation plans by a Wyoming-licensed engineer applies to dome structures that meet specific threshold conditions. The table below addresses each condition individually and demonstrates that none of the conditions are met by the LCMG domes.

Condition Required to Trigger Stamped Plans	Applies to LCMG Domes?	Justification
Structure is permanent	**NO**	Domes are fully removable; no foundation; no land alteration
Structure has a foundation	**NO**	Base ring bears on undisturbed native soil only; no footings
Structure introduces occupancy	**NO**	Non habitable agricultural facilities; no occupancy load
Structure is commercial	**NO**	Non commercial; government affiliated volunteer program
Structure creates a permanent building footprint	**NO**	Surface bearing only; land restored upon removal

Because the LCMG domes meet none of the five conditions that trigger the stamped-plans requirement, that requirement does not apply. The University of Wyoming Extension manual provides valuable construction guidance for agricultural dome structures, but engineering review under the building-code pathway is not required because the domes are not being permitted as buildings — they are being permitted as temporary agricultural facilities on government-owned land.

6. Compliance with Airport District Requirements

The following checklist demonstrates that the LCMG domes satisfy all applicable Airport District use and siting requirements.

Airport District Requirement	Status	Basis
Low profile — no interference with aviation sightlines	**PASS**	22 ft dome height; below airport height restriction threshold
No permanent structures introduced	**PASS**	Removable domes; no foundation; fully reversible
No occupancy or commercial use	**PASS**	Agricultural educational facility; non habitable
Low voltage electrical service only	**PASS**	Fan circuits and sensor controls only; no high voltage
Supports public education and community benefit	**PASS**	Youth STEM instruction; community horticultural demonstration
Fully removable and reversible	**PASS**	No excavation or demolition required for removal
Consistent with governmental / public benefit land use	**PASS**	Government affiliated LCMG; tax exempt airport district land

All seven Airport District compliance criteria are satisfied. The combination of low profile, non-permanent construction, non-commercial agricultural use, and governmental affiliation places the LCMG domes squarely within the category of allowable uses on airport-district land.

7. Analogous Agricultural Structure Classifications

The LCMG domes are not a novel structure type. Their classification as temporary agricultural accessory structures is consistent with the treatment of several analogous agricultural structures that are widely recognized under Wyoming and municipal code frameworks:

1. High tunnels and hoop houses: Unheated, surface-bearing agricultural structures commonly approved without foundation plans or building permits in Wyoming. The NRCS EQRP program funds high tunnels as agricultural equipment, not buildings. The LCMG domes are functionally equivalent to large high tunnels.
2. Geodesic growing domes: Specifically addressed in University of Wyoming Extension publications as agricultural season-extension structures. The UWY Extension manual is cited by the City as the applicable design reference, further confirming that these domes are treated as agricultural structures within the agricultural-code framework, not the building-code framework.

3. Temporary greenhouse structures: Structures covered by temporary or seasonal use permits that do not require engineered plans when they lack foundations, serve agricultural purposes, and are sited on agricultural or governmental land.

4. **Definition of "Temporary": Removability, Not Duration**:

   4.1 — The Structural Meaning of "Temporary" Establishes the core principle: in IBC, NRCS, and standard municipal zoning practice, "temporary" describes a *structural condition* — can the structure be removed without altering the land? — not a calendar interval. A foundation in place for six months is permanent. A dome in place for fifteen years with no foundation is still temporary. Duration is irrelevant.

   4.2 — Federal and State Precedent: High Tunnels as Permanent-Use Temporary Structures Uses NRCS EQIP as the clearest federal authority — high tunnels funded as agricultural *equipment*, routinely standing for 10–20+ years, with zero time-limit requirement. Then lands the Wyoming-specific punch: the three interconnected domes at the Wyoming State Fairgrounds in Douglas have been operating since 2018 with no one suggesting they need to come down. That's the state's own fairgrounds implicitly endorsing the removability-not-duration standard.

   4.3 — Why a Time-Based Interpretation Would Be Unreasonable and Unworkable Shows the absurdity of the alternative: under a duration test, a structurally unchanged dome would flip from legally temporary to code-violating permanent building on an arbitrary anniversary — with nothing physically having changed. The City cannot enforce that and would not want to.

   4.4 — The Correct Test: Land Alteration Upon Removal Closes with the clean, affirmative statement of the right standard and applies it directly to the LCMG domes: panels disassemble, base ring lifts off, soil is scooped out, and what remains is undisturbed native ground — unchanged from before day one.

In each of these analogous categories, the absence of a permanent foundation is the dispositive factor that keeps the structure in the agricultural equipment or temporary structure classification rather than the building classification.

8. Engineering Summary

The five geodesic greenhouse domes at the Laramie County Master Gardeners Demonstration Garden qualify as temporary agricultural accessory structures on governmental airport-district land. The following key design and use characteristics support this classification and are presented for final review by Planning and Development staff:

1. Each dome bears directly on undisturbed native soil. There is no concrete foundation, no pier system, no frost-protected footing, and no structural load transfer into the ground.

2. Anchoring is provided exclusively by continuous 3-foot-wide, 3-foot-high raised-bed soil ballast surrounding each dome perimeter, providing over 135,000 pounds of removable, non-structural mass across the site.
3. The ballast does not function as a foundation. It does not trigger structural engineering requirements. It does not create a permanent building footprint.
4. The domes introduce no occupancy, no commercial activity, and no permanent building footprint. They serve exclusively agricultural, educational, and governmental public-benefit purposes.
5. All five domes are fully removable without excavation, demolition, or land alteration, satisfying the City's criteria for non-permanent structures.
6. The structures comply with all Airport District use and siting requirements, including low-profile height, non-permanent construction, non-commercial use, and public-benefit function.

For these reasons, the LCMG domes do not trigger the requirement for stamped structural or foundation plans under the City of Cheyenne's building-code pathway. They are properly classified as temporary agricultural facilities consistent with allowable uses in the Airport District, in support of the Demonstration Garden's mission of public education, food security, and community engagement.

9. Climate Battery Excavation: How the Subsurface Thermal System Relates to the Dome Classification

Some of the geodesic domes in this site plan include Climate Battery systems — passive ground-coupled thermal storage systems consisting of buried perforated pipe runs surrounded by a gravel-soil thermal medium, connected to a vertical manifold and a low-power circulation fan. The full technical description is provided in Exhibit C1. This section is intended to help clarify how the Climate Battery relates to the dome above it, specifically whether the excavation involved should be considered part of the dome's structure or foundation, and whether it has any bearing on the dome's classification as a temporary agricultural accessory structure.

We hope the following explanation is helpful in working through that question. In short, the Climate Battery and the dome are two separate and independent systems that happen to share the same location — much like a buried irrigation cistern and the greenhouse standing above it. The Climate Battery is not connected to the dome structurally, does not carry any of its loads, and is reviewed under a different regulatory pathway. The dome's classification as a temporary agricultural structure stands on its own and is not affected by what lies beneath it.

9.1 Understanding Why the Climate Battery Is Not a Foundation: Structural Independence from the Dome

A foundation, in both common usage and building-code definition, is a structural element whose purpose is to receive and transfer the loads of a building into the supporting ground. A foundation is physically connected to the structure above it and is designed to resist the forces that structure imposes — gravity loads, wind uplift, lateral forces — by engaging the bearing capacity of the soil beneath.

Looking at the Climate Battery against that definition, it is easy to see that the two systems operate independently. As described in Exhibit C1, the 22-foot dome base ring bears on undisturbed native soil at grade — soil that lies entirely outside the 20-foot diameter Climate Battery pit. The dome's base ring

rests on the undisturbed ground that surrounds the pit, and the dome itself spans the pit opening as a clear span. No part of the dome touches the pit walls, the backfilled thermal medium, or the buried pipe network. The dome's weight and wind loads are carried entirely by the undisturbed soil beneath its base ring — the Climate Battery pit is simply not in that load path.

Because the Climate Battery is not structurally connected to the dome and carries none of its loads, it would not fit the definition of a foundation under standard building-code interpretation. The dome continues to behave as a surface-bearing structure resting on undisturbed soil, just as described throughout this exhibit. A helpful way to think about it: a drainage pipe or utility conduit buried beneath a high tunnel does not affect how that high tunnel is classified, and the Climate Battery works the same way here.

9.2 A Helpful Comparison: How Similar Subsurface Systems Are Treated in Agricultural Settings

It may be useful to consider how similar subsurface systems are handled in comparable agricultural and governmental land uses. Irrigation cisterns, root cellars, drainage tile systems, French drains, geothermal ground loops, and agricultural water storage pits all involve excavation beneath or near a structure, yet they are consistently treated as site improvements or agricultural infrastructure — separate from the structure above and reviewed under their own applicable permits — in Wyoming and throughout the country. The Climate Battery fits naturally in that same category.

The closest familiar analogy is a residential geothermal ground loop. Like the Climate Battery, a geothermal ground loop involves buried pipe runs exchanging heat with the surrounding ground to condition the building above — and in every jurisdiction that the applicant is aware of, ground loop systems are reviewed as mechanical system improvements, not as building foundations, regardless of the depth or extent of the excavation. The Climate Battery is a simpler and shallower version of the same basic concept, applied in an agricultural context.

9.3 What Permit Pathway Applies to the Climate Battery Excavation

The City of Cheyenne's building-code pathway for structural and foundation plan requirements is triggered by the presence of a building — a structure that is permanent, has a foundation, introduces occupancy, or creates a building footprint. As established in Section 5 of this exhibit, none of those conditions are met by the LCMG domes. The Climate Battery does not introduce any of those conditions independently.

The Climate Battery pit is an excavation, not a structure. Its walls are the native soil of the pit; it has no constructed walls, no roof, no occupancy, and no above-grade footprint. A subsurface excavation used for agricultural or mechanical purposes does not constitute a building under the International Building Code or the Cheyenne UDC. To the extent any permit is needed for the excavation itself, we would expect a grading or excavation permit to be the appropriate pathway — a process separate from structural plan review. We are happy to discuss the appropriate permit type with Planning staff and to submit whatever documentation is needed under that pathway.

9.4 Addressing a Reasonable Question: Does the Excavation Affect the Dome's Temporary Classification?

A reasonable question a reviewer might have is whether the Climate Battery excavation — which does involve disturbing the ground — affects the dome's status as a temporary structure under the

removability standard described in Section 7.4. This is a fair question, and we want to address it clearly. There are two points that we hope will be helpful in thinking it through.

First, the "temporary" classification is evaluated for the dome as a structure on its own terms — not for every improvement that happens to share the same parcel. The relevant question is whether the dome itself can be removed without altering the land. The dome's base ring rests on the soil surface and lifts off cleanly; the panels and frame disassemble by hand; and the ground beneath the base ring is undisturbed native soil throughout. The fact that the parcel also contains a separately reviewed Climate Battery does not change any of those physical facts about the dome. The Climate Battery is evaluated independently, under the grading and excavation pathway that applies to it.

Second, it is worth noting that the Climate Battery pit is itself restorable. The backfill material is a gravel-soil thermal medium that can be excavated; the perforated pipe network and manifold riser can be removed; and when all components are taken out and the pit is filled with native soil, the site returns to substantially its pre-installation condition. In that sense the Climate Battery is technically removable, much like a buried irrigation system, an underground cistern, or agricultural drainage tile — all of which are considered site improvements rather than permanent land alterations, and none of which affect the classification of the structures they serve.

9.5 Summary Guidance for the Reviewer

To summarize for the reviewer's convenience: the Climate Battery is a passive subsurface agricultural thermal exchange system — analogous in regulatory terms to a geothermal ground loop, buried irrigation cistern, or drainage tile installation. It is structurally independent of the dome above it, carries none of the dome's loads, and has no physical connection to the dome frame or base ring. It would be reviewed under a grading and excavation permit pathway rather than the building-code structural plan review pathway. It does not introduce the foundation, permanence, occupancy, or building-footprint conditions that would be needed to change the dome's classification.

We hope this section helps clarify that the dome and the Climate Battery, while located in the same place, are two distinct systems with different functions, different structural relationships to the ground, and different applicable review pathways. The dome can be evaluated on its own merits as a surface-bearing temporary agricultural structure, and the Climate Battery can be reviewed separately as a subsurface site improvement. We are glad to provide any additional information, or to meet with Planning staff to walk through the design in person, if that would be helpful.

10. Site Grading, Building Permit Thresholds, and Soil Balance

This section addresses site grading, applicable building permit thresholds, and the structural necessity of leveling each dome footprint. It has been revised to reflect a key finding: the excavation of each Climate Battery pit (described in Exhibit C1) generates a substantial volume of surplus soil that eliminates the need to import fill for dome footprint leveling and provides the primary supply of native soil for the raised planting beds surrounding each dome.

10.1 Climate Battery Excavation: Volumes and Surplus Soil

As described in Exhibit C1, Section 3.1, each Climate Battery is installed within a circular excavated pit measuring 20 feet in diameter, excavated to approximately 6 feet below finish grade to accommodate all three pipe layers. The gross excavated volume for one pit is:

$\pi \times (10\text{ ft})^2 \times 6\text{ ft} = 1{,}885\text{ ft}^3 \approx 69.8$ cubic yards per pit

Not all of that material can be re-used on-site. The Climate Battery backfill specification (Exhibit C1, Section 6) calls for a 60/40 blend of ¾-inch washed gravel and native excavated soil by volume. The native-soil fraction (40%) returns to the pit; the gravel fraction (60%) must be imported. The calculation of surplus native soil available for re-use elsewhere on the site is therefore:

Parameter	Value	Notes
Gross excavated volume per pit	**69.8 cu. yd.**	$\pi \times 10^2 \times 6\text{ ft} \div 27$
Native soil returned to pit (40% of backfill)	**27.9 cu. yd.**	40% fraction of 60/40 blend
Surplus native soil per pit (available for site use)	**41.9 cu. yd.**	Exported to stockpile for grading and raised beds
Surplus from 2 Climate Battery pits	**83.8 cu. yd.**	Available if 2 domes receive Climate Batteries

This surplus is clean, screened native soil — the same material specified for the 40% soil fraction of the thermal medium blend — and is suitable for both footprint leveling and raised bed fill without amendment.

10.2 Grading Permit Analysis: Pit Surplus Eliminates Import Need

According to the Laramie County Parcel Viewer there is an estimated 3-foot total elevation drop across Lots 1 and 2 (sloping eastward), producing a site grade of approximately 3%. At that grade, the elevation change across a single 22-foot dome diameter is:

22 ft × 0.03 = 0.66 ft (approximately 7.9 inches) per dome

Leveling each dome footprint using a cut-and-fill approach requires moving approximately 2.3 cubic yards per dome (cutting the high side by half the drop, filling the low side with the same material). In the worst case — where a raised perimeter wall or imported fill is used rather than a balanced cut-and-fill — the fill-only volume per dome is still only 2.3 cubic yards. Across all five dome footprints, the total fill demand is approximately 11.6 cubic yards.

The surplus from a single Climate Battery pit (41.9 cu. yd.) is more than three times the fill needed for all five dome footprints combined (11.6 cu. yd.). No fill soil needs to be imported to the site for dome footprint leveling. The grading permit exemption analysis under IBC Appendix J is straightforward:

Grading Permit Criterion (IBC Appendix J)	Status	Calculation / Basis
Volume moved: less than 50 cu. yd.?	**PASS**	~2.3 cu. yd. per dome; 11.6 cu. yd. for all five — well below 50 cu. yd. threshold
Fill depth: less than 1 ft on terrain ≤20% slope?	**PASS**	Max fill ~4 in. at low edge of each footprint; site grade 3% (well under 20%)

Fill does not support a permanent structure?	**PASS**	Domes classified as temporary agricultural structures — no permanent structure on fill
Grading does not obstruct natural drainage?	**PASS**	Minor leveling of individual footprints; erosion controls to be installed during work

All four IBC Appendix J exemption criteria are satisfied. No grading permit is required for dome footprint preparation. LCMG will install appropriate erosion controls (silt barriers or straw wattles at the downhill edge of each work area) during all grading activity, consistent with the legal requirement to prevent sediment from leaving the property.

10.3 Raised Bed Soil Balance: Pit Surplus as Primary Supply

Each dome is surrounded by continuous interior and exterior raised planting beds measuring 3 feet wide by 3 feet high (approximately 85 linear feet of perimeter per dome, as documented in Exhibit D, Section 4.1). The soil volume required for one set of raised beds is:

3 ft × 3 ft × 85 ft = 765 ft³ ≈ 28.3 cubic yards per dome

For all five domes, the total raised bed soil demand is approximately 141.6 cubic yards. The Climate Battery pit surplus provides a meaningful contribution toward this demand, with the balance sourced from on-site topsoil stripping and, where necessary, modest imported fill:

Soil Budget Item	Volume (cu. yd.)	Source / Notes
Surplus from 1 Climate Battery pit	**+41.9**	Clean native soil; direct re-use
Surplus from 2 Climate Battery pits (if applicable)	**+83.8**	Each additional pit adds 41.9 cu. yd.
Dome footprint leveling (all 5 domes, fill side)	**−11.6**	Supplied from pit surplus; no import needed
Raised beds — all 5 domes	**−141.6**	28.3 cu. yd. per dome × 5
Net shortfall (2 pits, after leveling)	**−69.4 cu. yd.**	To be sourced from on-site topsoil strip + modest import
Net shortfall (1 pit, after leveling)	**−111.3 cu. yd.**	Higher import if only 1 dome has Climate Battery

The net shortfall for raised bed fill will be addressed through a combination of on-site topsoil stripping during site preparation and targeted import of screened fill or compost-amended soil as needed. The Climate Battery excavation surplus significantly reduces import volume and associated cost compared to the original assumption that all raised bed soil would be imported. This should be reflected in the Detailed Budget Request Form as a line-item credit against soil procurement costs.

10.4 Building Permit Thresholds: City of Cheyenne and Laramie County

Each 22-foot geodesic dome has a circular footprint of approximately 380 square feet. This dimension must be addressed against both City and County permit thresholds.

City of Cheyenne: Within City of Cheyenne jurisdiction, detached accessory structures larger than 200 square feet require a building permit. At approximately 380 square feet, each LCMG dome exceeds this numerical threshold. **However, as established throughout this Exhibit, the domes are classified as temporary agricultural accessory structures — not buildings — by virtue of their lack of foundation, non-permanent construction, and exclusive agricultural and educational use**. The 200-square-foot building permit threshold applies to structures classified as buildings under the UDC; it does not reclassify agricultural equipment or temporary structures as buildings. The applicable permit pathway is a temporary agricultural structure or seasonal-use permit. LCMG will confirm the precise pathway with City Planning and Development staff.

Laramie County (unincorporated): For properties in unincorporated Laramie County, a 2025 amendment raised the accessory structure exemption threshold from 200 to 400 square feet. A 380-square-foot dome falls within this exemption entirely. LCMG will confirm applicable jurisdiction with County Planning.

Agricultural exemption pathway: A true agricultural exemption may also be available independently of the size-threshold analysis. Agricultural exemptions typically require AG zoning and use for primary farm production, and generally require filing an Agricultural Exemption Permit with the applicable authority. LCMG will explore this as a secondary pathway in consultation with planning staff.

10.5 Why Level Dome Footprints Are Structurally Required

A nearly 8-inch elevation difference across a 22-foot dome diameter is not compatible with direct installation on unlevel ground. Geodesic domes rely on the precise geometry of their triangulated frame to distribute loads uniformly around the base ring. A tilted base introduces differential loading with four specific consequences:

1. Structural frame distortion: Struts on opposite sides of a tilted dome carry unequal compression and tension. Under Cheyenne's snow loads and sustained high winds, this differential loading can cause frame warping or connector failure.
2. Water pooling and ingress: A sloped base allows water to collect against the high side of the dome and seep beneath the base ring, creating persistently wet conditions that undermine the growing environment.
3. Irrigation irregularity: Gravity migrates irrigation water to the low side of an unlevel dome, over-saturating plants at the downhill end while leaving those at the uphill end moisture-deficient.
4. Door and vent misalignment: Operational openings in an out-of-plumb frame cannot be properly aligned, affecting routine access and emergency ventilation.

LCMG will level each dome footprint using cut-and-fill before frame assembly, with the fill side mechanically compacted using a plate tamper to prevent post-installation settlement. As documented in Sections 10.1 and 10.2, the fill material for this work is supplied entirely by the Climate Battery pit surplus — no import is required. This leveling is operational site preparation, not foundation construction, and does not alter the dome's temporary agricultural structure classification.

10.6 Summary: Grading, Permits, and Soil Balance

Issue	Status	Basis / Notes

Grading permit required for dome footprint leveling?	**NO**	IBC Appendix J exemption satisfied: ~2.3 cu. yd. per dome; ~4-in. max fill; all four criteria met
Fill soil import required for footprint leveling?	**NO**	Climate Battery pit surplus (~41.9 cu. yd.) covers all 5 dome footprints (11.6 cu. yd. total) with ~30 cu. yd. to spare
Building permit required — City of Cheyenne?	**CONFIRM**	380 SF exceeds 200 SF city accessory building threshold; domes classified as temporary agricultural structures, not buildings. Confirm pathway with City Planning.
Building permit required — unincorporated Laramie County?	**EXEMPT**	2025 amendment raised County exemption to 400 SF; 380 SF dome falls within exemption. Confirm applicable jurisdiction.
Raised bed soil — full supply from pit surplus?	**PARTIAL**	Pit surplus (~41.9–83.8 cu. yd.) covers 30–60% of raised bed demand (141.6 cu. yd. total). Balance from on-site topsoil strip + targeted import.
Does footprint leveling alter dome's temporary classification?	**NO**	Dome remains surface-bearing; base ring lifts off leveled ground unchanged. Equivalent to high tunnel ground prep. Classification unchanged.

End of Exhibit D — Zoning and Land-Use Justification