

Roof at a Glance

2-story single-family house, built 2001 • cross-hipped / gabled shingle roof

TOTAL ROOF AREA

2,143 sf

21.4 squares • 7 facets • ±5%

PREDOMINANT PITCH

7/12

main 7/12 • cross roof 11.5/12

RIDGES / HIPPS / VALLEYS

57 / 0 / 36 lf

cross-hipped + gabled

RAKES / EAVES

103 / 58 lf

drip edge 162 lf

EXTERIOR WALLS (GROSS)

3,065 sf

perimeter 160 lf • ±10%

WALL FLASHING

80 lf

lower roofs into 2-story walls

IMAGERY AGREEMENT

0.8 ft

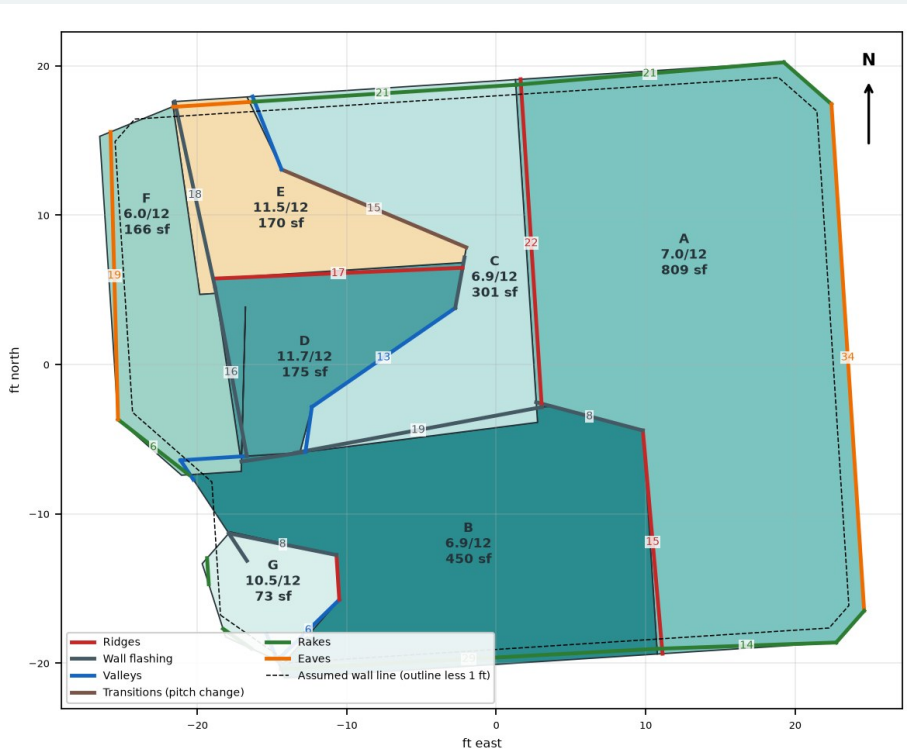
median edge offset • 8 aerials 2005-2025

SUGGESTED WASTE

15 %

24.6 sq incl. waste

ROOF PLAN • FACETS, RIDGES AND VALLEYS



AREA BY FACET

A	809 sf
B	450 sf
C	301 sf
D	175 sf
E	170 sf
F	166 sf
G	73 sf

Plan (footprint) area	1,802 sf
Ridge height	~32 ft above grade
Eave height	9.5-21.9 ft
Stories	2
Imagery edge offset	0.8 ft median (8 aerials)
Hail within 3 mi	8 reports, max 0.88 in
Flood zone	X (minimal hazard)

Summary. A 2-story single-family house (built 2001) with a cross-hipped and gabled main roof, a lower front roof that runs down to a 1-story eave, and a 6/12 roof over a 1-story west side section. Seven facets were measured from 2024 USGS 3DEP LiDAR plane fits (about 11 points per sq m); the outline is the outermost roof returns plus half the point spacing, so overhangs are included.



ROOF & WALL MEASUREMENT

SAMPLE

SITE

Collegeville, Pennsylvania
Single-family house, built 2001

OWNER OF RECORD

Withheld (sample)

REPORT DATE

October 10, 2026

MEASUREMENT BASIS

2024 USGS 3DEP LiDAR
8 aerials, 2005-2025
cross-checked to LiDAR
No street-level photos

REPORT ID

OA-S-0003

SHEETS

OA-01 Roof at a Glance

- OA-02 Roof Plan
- OA-03 Facet & Line Schedules
- OA-04 Edges & Flashing
- OA-05 Materials Takeoff
- OA-06 Extended Metrics
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SHEET

OA-01

1 of 13

Estimate from public data. Verify on site.

Roof Plan

Facets, ridges, valleys, rakes and eaves • lengths in feet



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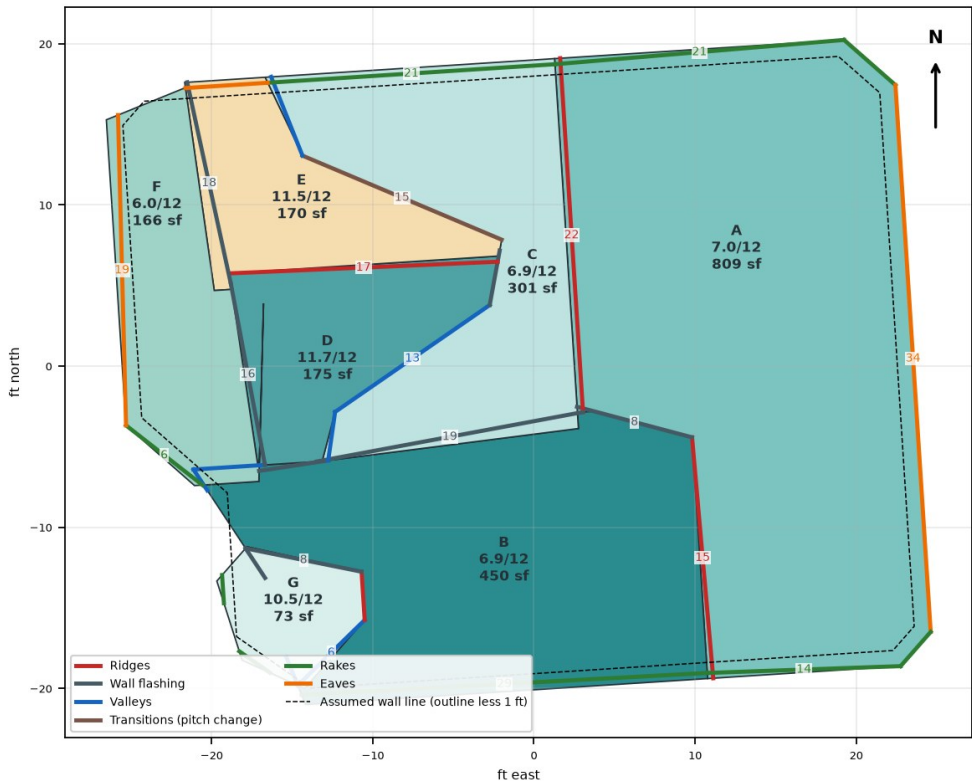
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SHEET

OA-02

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Estimate from public data. Verify on site.



Line type	Length lf
Ridge	57
Wall flashing	80
Valley	36
Pitch change	15
Rake	103
Eave	58
Drip edge (eaves + rakes)	162

How to read this plan

Each facet is labelled with its letter. Lines are plane intersections from the LiDAR surface model; eaves and rakes follow the traced outline including overhangs. Lengths in feet. Rakes, hips and valleys are true (sloped) lengths; eaves and ridges are level. "Wall flashing" marks where a lower roof meets a higher wall (step or headwall flashing). The dashed line is the assumed wall line (roof outline less a 1 ft overhang).

Facet & Line Schedules

One row per roof facet and per measured line

Facet	Description	Plan sf	Area sf	Pitch	± pitch	Faces	Eave ht	Top ht	Returns	Fit rmse
A	East-facing slope	700	809	7.0/12	—	E	19.2	31.4	604	—
B	West-facing slope	389	450	6.9/12	—	W	10.0	28.0	354	—
C	West-facing slope	262	301	6.9/12	—	W	21.9	32.2	213	—
D	South-facing slope	126	175	11.7/12	—	S	20.7	32.4	90	—
E	North-facing slope	122	170	11.5/12	—	N	19.5	31.9	120	—
F	West-facing slope	149	166	6.0/12	—	W	9.5	14.0	119	—
G	South-facing slope	55	73	10.5/12	—	S	11.7	19.6	28	—
Total		1,802	2,143	7/12 pred.						

Line	Facets	Length ft
Eaves	A	34.0
Eaves	F	19.3
Eaves	E	5.1
Rakes	B	29.1
Rakes	A	20.8
Rakes	C	20.6
Rakes	A	13.9
Rakes	F	6.4
Rakes	A	4.6
Rakes	A	3.1
Rakes	G	2.7
Rakes	G	2.3
Ridges	A/C	22.0
Ridges	D/E	16.7
Ridges	A/B	15.0
Ridges	B/G	3.0
Transitions (pitch change)	C/E	15.1

Line	Facets	Length ft
Valleys	C/D	13.0
Valleys	B/G	6.3
Valleys	C/E	5.3
Valleys	B/F	5.1
Valleys	C/D	3.1
Valleys	B/G	1.9
Valleys	B/F	1.6
Wall flashing	B/C	19.4
Wall flashing	E/F	17.6
Wall flashing	D/F	15.9
Wall flashing	A/B	8.4
Wall flashing	B/G	8.4
Wall flashing	B/D	5.0
Wall flashing	C/D	3.5
Wall flashing	B/G	2.3

Notes

Heights are feet above median adjacent ground. ± pitch is the bootstrap standard deviation in x/12. Returns = LiDAR points on the facet; fewer returns means lower confidence in pitch.



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SHEET

OA-03

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Estimate from public data. Verify on site.

Edges & Flashing

Every roof edge and joint, typed from the LiDAR surface model

Item	Quantity	Basis	Status
Ridges	57 lf	level ridges	Include
Hips	0 lf		Include
Valleys	36 lf	plane intersections	Include
Rakes	103 lf	sloped edges	Include
Eaves	58 lf	gutter-able edge	Include
Wall flashing	80 lf	lower roofs into 2-story walls (step / headwall)	Include
Pitch change	15 lf	7/12 into 11.5/12	Include
Drip edge	162 lf	eaves + rakes	Include
Hip + ridge cap	57 lf		Include
Starter	58 lf	eaves	Include
Leak barrier (eaves + valleys)	95 lf	if specified	Estimate
Vents / pipe boots	—	verify on site	Exclude

What this means for the job

Roof-to-wall lines are where the front roof (B), the west roof (F) and facet G meet the higher 2-story walls; split step vs headwall flashing on site.
Small jogs in the traced outline add short eave and rake pieces; totals are within ±1-2 ft per line.



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Materials Takeoff

Pitched-roof quantities for estimating • guidance only, verify before ordering

Item	Quantity	Basis
Total roof area	2,143 sf	7 facets, pitch-adjusted
Ridges	57 lf	
Hips	0 lf	
Valleys	36 lf	
Rakes	103 lf	sloped
Eaves	58 lf	
Wall flashing (roof-to-wall)	80 lf	step / headwall
Pitch change	15 lf	
Drip edge	162 lf	eaves + rakes
Hip + ridge cap	57 lf	
Starter	58 lf	eaves

Suggested waste 15% for a cut-up roof with valleys and roof-to-wall lines (guidance only).
Waste table excludes ridge cap and starter.

WASTE TABLE

Waste %	Area sf	Squares
0%	2,143	21.43
5%	2,250	22.50
10%	2,358	23.58
12%	2,400	24.00
15%	2,465	24.65
17%	2,508	25.08
20%	2,572	25.72
22%	2,615	26.15

AREA BY PITCH

Pitch	Area sf	Share
6/12	166	8%
7/12	1,560	73%
10/12	73	3%
12/12	345	16%

SUGGESTED ORDER

24.6 sq

roof area + 15% waste



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SHEET

OA-05

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Estimate from public data. Verify on site.

Extended Metrics

Industry-report items beyond the core takeoff • each tagged Include / Estimate / Exclude

Item	Status	Value / basis
Total roof area (pitch-adjusted)	Include	2,143 sf, ±5%
Plan roof area	Include	1,802 sf
Facets / pitches	Include	7 facets
Area by pitch	Include	OA-05
Ridges, hips, valleys, rakes, eaves	Include	plane intersections + outline
Wall (step / headwall) flashing	Include	lower roofs into 2-story walls
Drip edge / starter / ridge cap	Include	from line totals
Suggested waste	Estimate	15%, cut-up roof with valleys
Ridge / eave heights	Include	LiDAR

Item	Status	Value / basis
Stories	Include	2 (county record)
Exterior wall area by side	Estimate	3,065 sf gross, ±10%
Corners	Include	9 out / 1 in
Imagery cross-check	Include	8 aerials
Change review / roof age	Estimate	possible re-roof 2010-2015, not confirmed
Hail / wind history	Include	NOAA SPC + NCEI
Flood zone	Include	FEMA NFHL
Code / wind speed	Estimate	PA UCC; ASCE 7-16



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Height Profile & 3D

LiDAR side views through the roof, and a 3D view of the fitted planes



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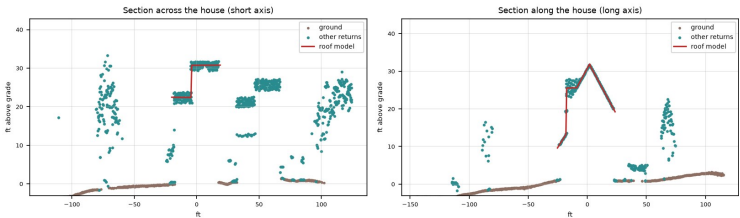
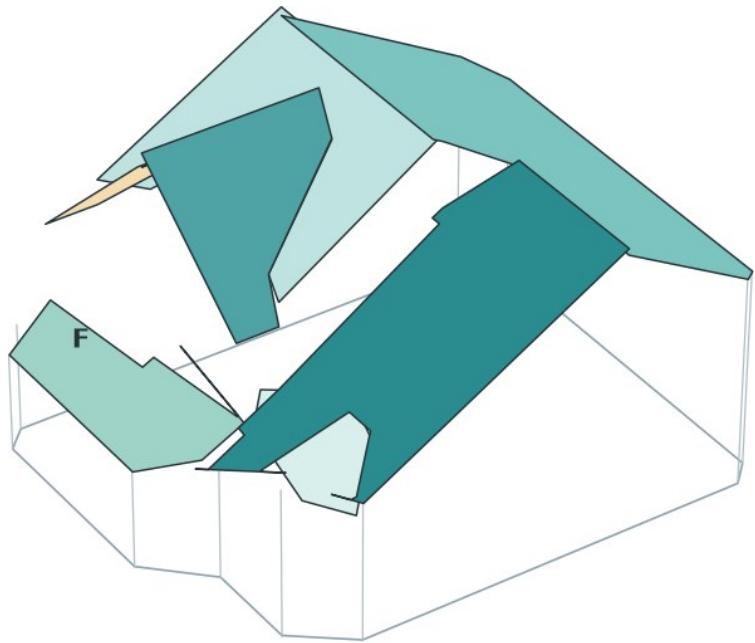
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Main ridges are about 32 ft above grade (2-story block). Eaves of the 2-story block are about 19-23 ft above grade; the front roof (B) and the west side roof (F) come down to 1-story eaves at about 10 ft. The steeper 11.5-11.7/12 facets (D, E) form the cross roof over the west half of the 2-story block.

HEIGHTS BY FACET (FT ABOVE GRADE)

Facet	Eave ht	Top ht	Pitch
A	19.2 ft	31.4 ft	7.0/12
B	10.0 ft	28.0 ft	6.9/12
C	21.9 ft	32.2 ft	6.9/12
D	20.7 ft	32.4 ft	11.7/12
E	19.5 ft	31.9 ft	11.5/12
F	9.5 ft	14.0 ft	6.0/12
G	11.7 ft	19.6 ft	10.5/12

SHEET

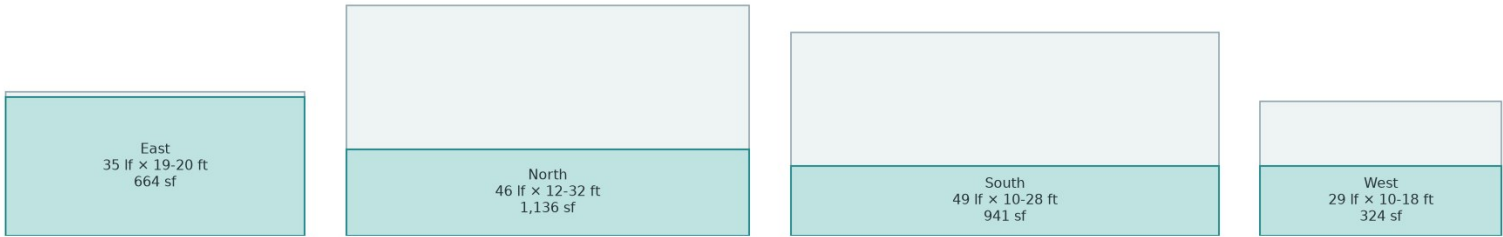
OA-07

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Estimate from public data. Verify on site.

Exterior Walls

Outer face, grade to roof edge • LiDAR heights on the assumed wall line



Side	Length lf	Height ft	Gross sf	Openings	Net sf	Material
East	35.0	18.9-19.6	664	verify on site	—	verify on site
North	46.0	11.8-31.5	1,136	verify on site	—	verify on site
South	48.6	9.5-27.8	941	verify on site	—	verify on site
West	28.9	9.5-18.3	324	verify on site	—	verify on site
Total	159.7		3,065			

Method. Walls follow the LiDAR roof outline less a 1 ft overhang, at 1 ft steps (160 lf). Grade is the median LiDAR ground return 1-15 ft outside each station (about 180 ft NAVD88); the wall top is the roof surface above that station, so gable and upper walls of the 2-story block are included. Confidence Medium ($\pm 10\%$).

Corners: 9 outside, 1 inside (traced outline; small jogs count). **Openings and materials:** no street-level photos are used in this sample, so windows, doors, siding and trim are verify on site and net area is not given.



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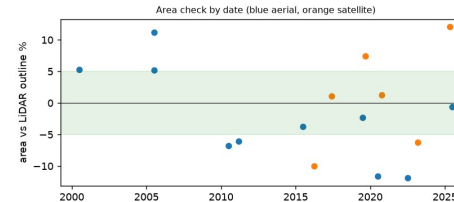
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Imagery Cross-check

Every aerial registered to the LiDAR outline and re-traced edge by edge

Source	Date	Kind	Shift ft	Edges	Area Δ
DVRPC	2000	aerial	2.1	47%	+5.3%
PAMAP	2005 (2003)	aerial	2.0	100%	+11.2%
DVRPC	2005	aerial	2.7	100%	+5.2%
DVRPC	2010	aerial	1.6	100%	-6.8%
DVRPC	2015	aerial	1.3	75%	-3.8%
PEMA	2019 (2018)	aerial	5.8	100%	-2.3%
DVRPC	2020	aerial	2.1	100%	-11.6%
PEMA	2022 (2021)	aerial	4.4	100%	-11.9%
DVRPC	2025	aerial	2.2	100%	-0.6%
Esri WB	2011-03-19	aerial	5.6	100%	-6.1%
Esri WB sat.	2016-04-26	satellite	2.9	100%	-10.0%
Esri WB sat.	2017-06-20	satellite	4.0	67%	+1.0%
Esri WB sat.	2019-09-22	satellite	7.8	100%	+7.4%
Esri WB sat.	2020-10-03	satellite	11.5	100%	+1.3%
Esri WB sat.	2023-03-29	satellite	12.0	100%	-6.3%
Esri WB sat.	2025-05-17	satellite	11.9	86%	+12.1%



How it is checked

Each image is shifted to best match the brightness step along the LiDAR outline, then every edge 10 ft or longer is re-traced at the strongest step within ± 5 ft. Weak or short edges are left unresolved. Area Δ compares the re-traced outline with the LiDAR outline. Leaning satellite captures are kept out of the agreement range.

Result

Agreement: 8 aerials with 80% or more of edges resolved trace the roof outline within **-11.9% to +11.2%** of the measured outline (1,802 sf plan); median edge offset 0.8 ft. On a roof this size a 1 ft average edge offset is about 9% of area, so the spread is mostly sub-foot edge placement. Satellite captures lean and are left out.



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SHEET

OA-09

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Imagery Change Review

Same roof, every image date • outline overlaid on each image



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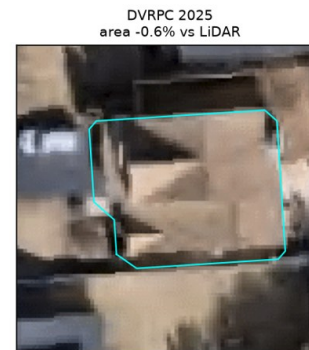
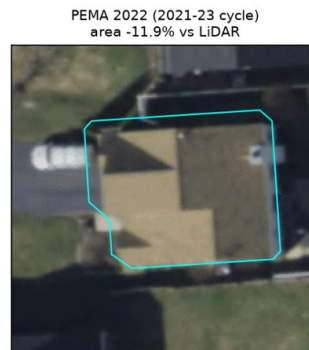
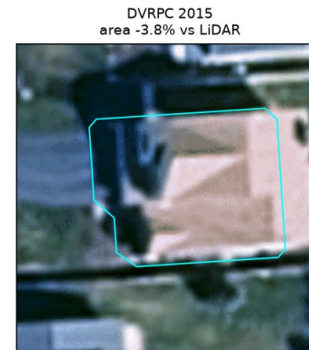
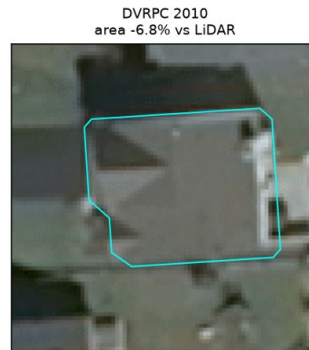
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OA-10

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Change review: the 2000 regional aerial shows no finished house on the lot (county record: built 2001). From 2005 to 2025 the house outline is the same in every aerial; no additions or demolitions found.

The roof reads dark grey in 2005 and 2010 and lighter in 2015 and later. That could be a re-roof between 2010 and 2015, but lighting and sensor differences could also explain it, so it is not confirmed and no roof age is stated.

Item	Value
Location	Collegeville, Pennsylvania
Use	Single-family residence, 2 stories (county record)
Year built	2001 (county record)
Living area	2,069 sf (county record)
Owner / parcel	withheld (sample)
FEMA flood zone	Zone X (area of minimal flood hazard), FIRM panel 42091C0229G, effective 2016-03-02
Building code	Pennsylvania UCC: 2018 International Residential Code (confirm local amendments with the municipality)
Design wind speed	~115 mph ultimate (ASCE 7-16, Risk Cat. II) - Estimate; confirm with ASCE Hazard Tool and the code official

Hail of 1 in or larger within 3 mi: none reported; largest within 3 mi 0.88 in. Sources: NOAA SPC storm reports (2006-2025) and NCEI Storm Events (2026 to date). Storm reports are point observations and do not mean this roof was damaged.

Reports 2006-2026	1 mi	3 mi	10 mi	max 3 mi
Hail	0	8	65	0.88 in
Damaging wind	1	18	273	61 kt

HAIL REPORTS WITHIN 3 MI

Date	Size	Distance
2006-07-18	0.75 in	1.3 mi
2008-07-23	0.88 in	1.3 mi
2009-06-26	0.88 in	1.3 mi
2019-06-28	0.75 in	1.9 mi
2021-04-21	0.88 in	1.7 mi
2021-07-21	0.88 in	2.5 mi
2024-08-18	0.88 in	1.9 mi
2024-08-18	0.88 in	3.0 mi



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Metric Coverage

Every metric a report could carry, and whether this report provides it from public data

Metric	Status	Value / reason
Total roof area (pitch-adjusted)	Include	2,143 sf, ±5%
Plan roof area	Include	1,802 sf
Facets / pitches	Include	7 facets
Area by pitch	Include	OA-05
Ridges, hips, valleys, rakes, eaves	Include	plane intersections + outline
Wall (step / headwall) flashing	Include	lower roofs into 2-story walls
Drip edge / starter / ridge cap	Include	from line totals
Suggested waste	Estimate	15%, cut-up roof with valleys
Ridge / eave heights	Include	LiDAR
Stories	Include	2 (county record)
Exterior wall area by side	Estimate	3,065 sf gross, ±10%

Metric	Status	Value / reason
Corners	Include	9 out / 1 in
Imagery cross-check	Include	8 aerials
Change review / roof age	Estimate	possible re-roof 2010-2015, not confirmed
Hail / wind history	Include	NOAA SPC + NCEI
Flood zone	Include	FEMA NFHL
Code / wind speed	Estimate	PA UCC; ASCE 7-16
Wall openings / siding	Exclude	no street-level photos
Vents / pipe boots / skylights	Exclude	verify on site
Gutters / downspouts	Exclude	verify on site
Decking / condition	Exclude	verify on site

13 included • 4 estimated • 4 excluded (verify on site)

Overhead Analytics • Sample report (owner and street address withheld) • Estimates from public aerial imagery and LiDAR; no site visit.



ROOF & WALL MEASUREMENT

SAMPLE

SITE
Collegeville, Pennsylvania
Single-family house, built 2001

OWNER OF RECORD
Withheld (sample)

REPORT DATE
October 10, 2026

MEASUREMENT BASIS
2024 USGS 3DEP LiDAR
8 aerials, 2005-2025
cross-checked to LiDAR
No street-level photos

REPORT ID
OA-S-0003

- SHEETS
- OA-01 Roof at a Glance
 - OA-02 Roof Plan
 - OA-03 Facet & Line Schedules
 - OA-04 Edges & Flashing
 - OA-05 Materials Takeoff
 - OA-06 Extended Metrics
 - OA-07 Height Profile & 3D
 - OA-08 Exterior Walls
 - OA-09 Imagery Cross-check
 - OA-10 Imagery Change Review
 - OA-11 Property, Weather & Code
 - OA-12 Metric Coverage**
 - OA-13 Sources & Confidence

Sources & Confidence

What the numbers rest on, and how far to trust each

Item	Confidence	Basis
Roof area	● ● ● ● ●	High ±5%
Main pitches	● ● ● ● ●	High ±0.3/12
Facet G, west junctions	● ● ● ● ●	Medium 28-120 returns
Line lengths	● ● ● ● ●	Medium ±1-2 ft
Heights	● ● ● ● ●	High 2024 LiDAR
Wall areas	● ● ● ● ●	Medium ±10%, no openings
Imagery agreement	● ● ● ● ●	Medium 8 aerials

Files delivered with this report

Overhead-Analytics-Sample-Residential.pdf (this report)
Paid orders also include CSV, XML, DXF and GeoJSON data files.

Data sources: USGS 3DEP LiDAR, project PA_17County_D24 (2024, ~11 pts/sq m). Orthophotos via PASDA: DVRPC regional 2000-2025, PAMAP 2003-06, PEMA 2018-20 and 2021-23. Esri World Imagery Wayback (cross-check only). Montgomery County parcel and assessment records. FEMA NFHL. NOAA SPC and NCEI storm reports.

Method: roof returns were split into planes with RANSAC (0.35 ft tolerance) and re-fitted by least squares. Each 1 ft cell of the outline takes the plane that best matches the local LiDAR height; facet edges follow those boundaries and lines are typed by geometry. Area = plan area x pitch factor.

Main uncertainties: facet G (28 returns) and the west junctions of D, E and F are the least certain; line lengths are ±1-2 ft; the wall line assumes a 1 ft overhang. Total area ±5%.

Excluded / verify on site: vents, pipe boots, skylights, chimney details, gutters and downspouts, siding and openings, decks and porches under 7 ft, roof condition.

Disclaimer: This report is an estimate from public aerial imagery and LiDAR, prepared by Overhead Analytics without a site visit. Sample report: owner, street address and parcel id are withheld. Not affiliated with any measurement vendor or manufacturer. Verify all measurements in the field before ordering materials.



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