

ORDINANCE NO. 510-0

A SOLAR BALANCE POINT ORDINANCE PROMOTING THE USE OF SOLAR ENERGY, MINIMIZING SHADING OF STRUCTURES BY STRUCTURES AND ACCESSORY STRUCTURES, AND, WHERE APPLICABLE, TO MINIMIZE SHADING OF STRUCTURES BY TREES.

3.480 SOLAR BALANCE POINT RECOMMENDATIONS

3.481 Purpose. The purpose of this section is to promote the use of solar energy, to minimize shading of structures by structures and accessory structures, and where applicable, to minimize shading of structures by trees. Decisions related to this ordinance are intended to be ministerial.

3.482 Applicability. This section applies to an application for a building permit for all structures in R20, R10, R7, R5, R4 and A2 and all single family detached structures in any zone, except to the extent the Director finds the applicant has shown that one or more of the conditions listed in S3.485 or 3.486 exists, and exemptions or adjustments provided for there are warranted. In addition, non-exempt vegetation planted on lots subjects to the provisions of S3.476 of the Solar Access Requirements for New development shall comply with the shade point height standards as provided in S3.484 and S3.485.

3.483 Solar Site Plan required. An applicant for a building permit for a structure subject to this ordinance shall submit a site plan that shows the maximum shade point height allowed under S3.484 and the allowed shade on the proposed structure's solar features as provided in S3.487. If applicable, the site plan also shall show the solar balance point for the structure as provided in S3.488.

3.484 Maximum Shade Point Height Standard. The height of the shade point shall comply with either A or B below .

A. Basic Requirement. The height of the shade point shall be less than or equal to the height specified in Table A or computed using the following formula. If necessary interpolate between the 5 foot dimensions listed in Table A.

$$H = \frac{(2xSRL) - N + 150}{5}$$

Where: H = the maximum allowed height of the shade point (see Figure 3.470 (d) and 3.470 (e);

SRL = shade reduction line (the distance between the shade point and the northern lot line, see Figure 3.470 (f): and

N = the north-south lot dimension, provided that a north-south lot dimension more than 90 feet shall use a value of 90 feet for this section.

Provided, the maximum allowed height of the shade point may be increased one foot above the amount calculated using the formula or Table A for each foot that the average grade at the rear property line exceeds the average grade at the front property line.

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TABLE A - MAXIMUM PERMITTED SHADE POINT HEIGHT (In Feet)

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Distance to Shade Reduction Line from northern lot line(in feet)	North-south lot dimension(in feet)													
	100+	95	90	85	80	75	70	65	60	55	50	45	40	
70	40	40	40	41	42	43	44							
65	38	38	38	39	40	41	42	43						
60	36	36	36	37	38	39	40	41	42					
55	34	34	34	35	36	37	38	39	40	41				
50	32	32	32	33	34	35	36	37	38	39	40	41	42	
45	30	30	30	31	32	33	34	35	36	37	38	39	40	
40	28	28	28	29	30	31	32	33	34	35	36	37	38	
35	26	26	26	27	28	29	30	31	32	33	34	35	36	
30	24	24	24	25	26	27	28	29	30	31	32	33	34	
25	22	22	22	23	24	25	26	27	28	29	30	31	32	
20	20	20	20	21	22	23	24	25	26	27	28	29	30	
15	18	18	18	19	20	21	22	23	24	25	26	27	28	
10	16	16	16	17	18	19	20	21	22	23	24	25	26	
5	14	14	14	15	16	17	18	19	20	21	22	23	24	

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B. Performance Option. The proposed structure, or applicable vegetation, will shade not more than 20 per cent of the south-facing glazing of existing habitable structure(s), or, where applicable, the proposed structure or non-exempt vegetation comply with S3.473 (B) or S3.473 (C) (New Development Standards). If S3.473 (B), Protected Solar Building Line, is used, non-exempt trees and the shade point of structures shall be set back from the protected solar building line 2.5 feet for every 1 foot of height of the structure or of the mature height of non-exempt vegetation over 2 feet.

3.485

Exemption from the Maximum Shade Point Height Standard. The Director shall exempt a proposed structure or non-exempt vegetation from S3.483 and 3.484 if the applicant shows that one or more of the conditions in this section exist, based on plot plans or plats, corner elevations or other topographical data, shadow patterns, suncharts or photographs, or other substantial evidence submitted by the applicant.

A. Exempt Lot. When created the lot was subject to the S3.473 and was not subject to the provisions of S3.476.

B. Pre-existing shade. The structure or applicable non-exempt vegetation will shade an area that is shaded by one more of the following:

1. An existing or approved building or structure;

2. A topographic feature;

3. A non-exempt tree that will remain after development of the site. It is assumed a tree will remain after development if it: is situated in a building setback required by local law; is part of a development area or required by local law, a public park or landscape strip or legally reserved open space; is in or separated from the developable remainder of a parcel by an undevelopable area or feature; or is on the applicant's property and not affected by the development. A duly executed covenant also can be used to preserve trees causing such shade.

C. Slope. The site has an average slope that exceeds 20 percent in a direction greater than 45 degrees east or west of true south based on a topographic survey by a licensed professional land surveyor.

D. Insignificant benefit. The proposed structure or non-exempt vegetation shades one or more of the following:

1. An undevelopable area; or

2. The wall of an unheated space, such as a typical garage; or

3. Less than 20 square feet of south-facing glazing.

E. Public Improvement. The proposed structure is a publicly owned improvement.

3.486

Adjustments to the Maximum Shade Point Height Standard. The Director shall increase the maximum permitted height of the shade point determined using S3.484 to the extent it finds the applicant has shown one or more of the following conditions exist, based on plot plans or plats, corner elevations or other topographical data, shadow patterns, suncharts or photographs, or other substantial evidence submitted by the applicant.

- A. Physical conditions. Physical conditions preclude development of the site in a manner that complies with S3.484, due to such things as a lot size less than 3,000 square feet, unstable or wet soils, or a drainage way, public or private easement, or right of way.
- B. Conflict between the maximum Shade Point Height and Allowed Shade on the Solar Feature Standards. A proposed structure may be sited to meet the solar balance point standard described in S3.488 or be sited as near to the solar balance point as allowed by S3.488, if:
  1. When the proposed structure is sited to meet the maximum shade point height standard determined using S3.484, its solar feature will potentially be shaded as determined using S3.487, and
  2. The application includes a form provided by the City that:
    - a. Releases the applicant from complying with S3.484 and agrees that the proposed structure may shade an area otherwise protected by S3.484.
    - b. Releases the City from liability for damages resulting from the adjustment; and
    - c. Is signed by the owner(s) of the properties that would be shaded by the proposed structure more than allowed by the provisions of S3.484.
  3. Before the City issues a permit for a proposed structure for which an adjustment has been granted pursuant to S3.486 (B), the applicant shall file the form provided for in subsection B.2 above in the office of the County Recorder with the deeds to the affected properties.

3.487

Analysis of Allowed Shade on Solar Feature

- A. The applicant is exempt from S3.487 if the lot(s) south and adjoining the applicant's property is exempt from S3.484 of this ordinance.
- B. Applicants shall be encouraged to design and site a proposed habitable structure so that the lowest height of the solar feature(s) will not be shaded by building or non-exempt trees on lot(s) to the south. The applicant shall complete the following calculation procedure to determine if the solar feature(s) of the proposed structure will be shaded. To start, the applicant shall chose which of the following sources of shade originating from adjacent lot(s) to the south to use to calculate the maximum shade height at the north property line:
  - 1. Existing structure(s) or non-exempt trees: or
  - 2. The maximum shade that can be cast from future buildings or non-exempt trees, based on Table C. If the lot(s) to the south can be further divided, then the north-south dimension shall be assumed to be the minimum lot width required for a new lot in that zone.
- C. The height of the lowest point of any solar feature of the proposed structure shall be calculated with respect to either the average elevation or the elevation at the midpoint of the front lot line of the lot to the south.
- D. The applicant shall determine the height of the shadow that may be cast upon the applicant's solar feature by the source of shade selected in subsection B by using the following formula or Table B.

$$\text{SFSH} = \text{SH} (\text{SGL}/2.5)$$

Where:

- SFSH = the allowed shadow height on the solar feature (see figure 3.470 (h))
- SH = the height of the shade at the northern lot line of lot(s) to the south as determined in S3.487 (B)
- SGL = the solar gain line (the distance from the solar feature to the northern lot line of adjacent lot(s) to the south, see Figure 3.470 (g))

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TABLE B - MAXIMUM PERMITTED HEIGHT OF SHADOW AT SOLAR FEATURE (in feet)

Allowed Shade Height at Northern Lot Line  
of Adjacent Lot(s) to the South (In Feet)

Distance from  
Solar Gain  
Line to lot  
line (in feet)

	22	21	20	19	18	17	16	15	14	13	12
50	2	1									
45	4	3	2	1							
40	6	5	4	3	2	1					
35	8	7	6	5	4	3	2	1			
30	10	9	8	7	6	5	4	3	2	1	
25	12	11	10	9	8	7	6	5	4	3	2
20	14	13	12	11	10	9	8	7	6	5	4
15	16	15	14	13	12	11	10	9	8	7	6
10	18	17	16	15	14	13	12	11	10	9	8
5	20	19	18	17	16	15	14	13	12	11	10

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Table C may be used to determine (SH) in the above formula.

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TABLE C

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North-South lot  
dimension of adjacent  
lot(s) to the south

	100	95	90	85	80	75	70	65	60	55	50	45	40
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Allowed shade  
height at the north  
property line of  
adjacent lot(s) to south

	12	12	12	13	14	15	16	17	18	19	20	21	22
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- E. If the allowed shade height on the solar feature calculated in subsection D is higher than the lowest height of the solar feature calculated in subsection C the applicant shall be encouraged to consider any changes to the house design or location which would make it practical to locate the solar feature so that it will not be shaded in the future.

3.488 Solar Balance Point. If a structure does not comply with the maximum shade point height standard in S3.484 and the allowed shade on a solar feature standard in S3.487, then the solar balance point of the lot shall be calculated (see Figure 3.470 (h)). The solar balance point is the point on the lot where a structure would be the same from complying with both of these standards.

3.049 Yard Setback Adjustment. The City shall grant an adjustment to the side or rear yard setback requirement(s) by up to 50% and to the front yard setback by up to 20% if necessary to build a proposed structure so it complies with either the shade point height standard in S3.484, the allowed shade on a solar feature standard in S3.487, or the solar balance point standard in S3.488 as provided herein (see Figure 3.470 (h)). This adjustment is not intended to encourage reductions in available solar access or unnecessary modification of setback requirements, and shall apply only if necessary for a structure to comply with applicable provisions of this ordinance. (The following list illustrates yard adjustments permitted under this section:)

A. R4 Zone(s):

1. A front yard setback may be reduced to not less than 16 feet.
2. A rear yard setback may be reduced to not less than 7.5 feet.
3. A side yard setback may be reduced to not less than 3 feet.

B. R5 Zone(s):

1. A front yard setback may be reduced to not less than 16 feet.
2. A rear yard setback may be reduced to not less than 10 Feet.
3. A side yard setback may be reduced to not less than 3 feet.

C. R7 Zone(s):

1. A front yard setback may be reduced to not less than 16 feet.
2. A rear yard setback may be reduced to not less than 10 feet.

3. A side yard setback may be reduced to not less than 3 feet.

D. R10 Zone (s):

1. A front yard setback may be reduced to not less than 16 feet.
2. A rear yard setback may be reduced to not less than 10 feet.
3. A side yard setback may be reduced to not less than 5 feet.

E. R20 Zone(s):

1. A front yard setback may be reduced to not less than 24 feet.
2. A rear yard setback may be reduced to not less 12.5 feet.
3. A side yard setback may be reduced to not less than 12.5 feet.

3.050 Review process.

All applications will be reviewed through a Type I or Type II procedure as set forth in Article 2, Development Ordinance. All violations of any provisions of this ordinance are subject to abatement and penalty procedures listed in Section 10.230 of the Development Ordinance.



NOW, THEREFORE, BE IT ORDAINED BY THE COMMON COUNCIL OF THE CITY OF TROUTDALE THAT:

Section 3.480 through 3.490 be adopted as part of the Article 3, Zoning Districts, Development Ordinance.

Effective Date of Ordinance: September 1, 1988

PASSED BY THE COMMON COUNCIL OF THE CITY OF TROUTDALE THIS 22ND DAY OF MARCH, 1988.

YEAS 4

NAYS 0

ABSTAINED 1-BUI

Sam K Cox  
Sam K. Cox, Mayor

Date Signed: MARCH 24, 1988

ATTEST:

[Signature]  
aglione  
City Recorder  
CD24 16