

Ana da Fonseca
The *Port* and the Automaton

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North Sea: Landscapes of Coexistence
Transitional Territories Studio 2018-2019

MSc3 Architecture Report

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5. The Project

5.1. Proposition

basically what was written for the 'Letter' exercise: overall problem statement and project proposition

5.2. Objectives

in line with the proposition, at different scales: territorial, site and architectonic scales

5.2. Relevance

role of the proposed project in relation to its cultural and physical landscape: societal (political/ economic) and environmental relevance

5.3. Project

- a. Regional Scale
- b. Urban Scale
- c. Spatial Concept
- d. Architectural Scale

5.4. Action Spaces

5.5. Floorplan Translation

5.6. Action Spaces

5.7. Elevation Scoring

5.8. Introduction of the Machine

5.9. Grounding of The Project

6.0 The Automated Pier

6.0 The Spectacle

Proposal/ The Action

5. The Project

5.2. Objectives

1.

To introduce a new industry to the port of grimsby as a modes to regenerate the economy of the port city but also to regenerate the estuary in itself. Replacing the fishery and automotive industry with an industry that provides future prospects and growth potential, but also introduces the new sustainable energy future that is present at a territorial level. The port can start of by catering to the National offshore energy farms, but go on to cater for the future North sea energy ring.

2.

The Factory should allow for human engagement, visibility in order to raise awareness but also provide a spectacle to this "ghost town" the city has become. Although automation might see production jobs decrease, knowledge of the production system must be taught, in order to provide people with the knowledge to adapt to the future jobs that may come from automation (Analysis, energy research, logistical research... etc.)

3.

At an architectural scale, the project must look at the expansion of these logistical units and its impact on the landscape and built environment. If it were to be replicated how can an architecture of quality be intregated with the demands of the logistics industry? What role does the human play in the future of this port, and where is his place within the built environment?

Relevance

The transitional territories studio, under the chair of public building is an inter-disciplinary studio with designers, urban planners and water managers/engineers. This graduation project has its inception in a theoretical framework based on the notion of space as a territory put forth by Claude Raffestin in which he argues that space is not a given construct but socially appropriated and "territorialised" by humans as the object of social practice and knowledge. He argues that territorial space has a certain territoriality (behaviour), consisting of relations between social groups on different social, spatial and temporal scales. The nature of the territory as a temporal and multi-scalar space requires a multi-methodological approach to research. My thesis research will look at the implementation of different methodologies at certain scales of the design project, with an emphasis on scenario based design and mapping as a means to connect the scales to the temporal quality of the research.

The choice of the port as a project which allows for exploration in the role of architecture and the architect in the design of logistical networks. This is relevant as the world we see today according to graham, is governed by these networks that are connected on a global scale but splinter the urban and local scale they are placed upon. Advances in technology and capitalism have seen the ports become a place of great wealth but simultaneously one of great social disadvantage and deprivation. How to make the project of a port a public one also?

What my research already suggests is that socio-economic shifts (such as Brexit and new Trading routes) in an era of globalisation and hyper mobility can have catastrophic results on the British port context. Expansion must be strategic, to avoid de creation of a string of low quality logistical architectural artefacts devoid of any aesthetical and societal purpose. It is no longer enough for a project to design a solution to current problems, it must also question the role it will play if the context were to change.



Image: Port separation

Source: Self made



Image: Port Island

Source: Self made



Image: Shoreline
Source: Self made

Architectural Research

53. Architectural Project

a. Configuration and Composition

The configuration and composition of the project is based primarily on the technical and function requirements of the logistics industry combined with aspect related to automation. The order in which these elements is placed is based on a sequence from production, to storage, to loading and exporting. In reverse, offshore turbines can also arrive at the quay, unload, be repaired and reshipped all on the island. Avoiding further transport onto shore, and keeping the global scale of the industry separate from the coastline. The project aims at unraveling this chain in such a way that allows for expansion into other offshore energy industries (reparation), without consuming the local shoreline. The rearrangement also considers where the human presence ends and where automation will take control. The project aims to contain the automation within one single architectural object, and seeks to determine the relationship between form and automation

b. Performance

The project must first meet the technical needs of the industry, both in terms of logistics (quay length, infrastructure, storage), and in terms of manufacturing (factory building standards, machinery space, movement space). The goal is how to arrange these to integrate, form flow and funtion into one automated architectural object. The aim is to create a cycle of flows through the building but also in how it is materialised.

c. Function and Program

The functional aspect of the project is split into the functions of an offshore wind terminal (production, maintanance and repair, temporary storage.) And will investigate the impact of automation on the human in relation to the port. Where will the human end up? and how can they be a part of this global network of flows.

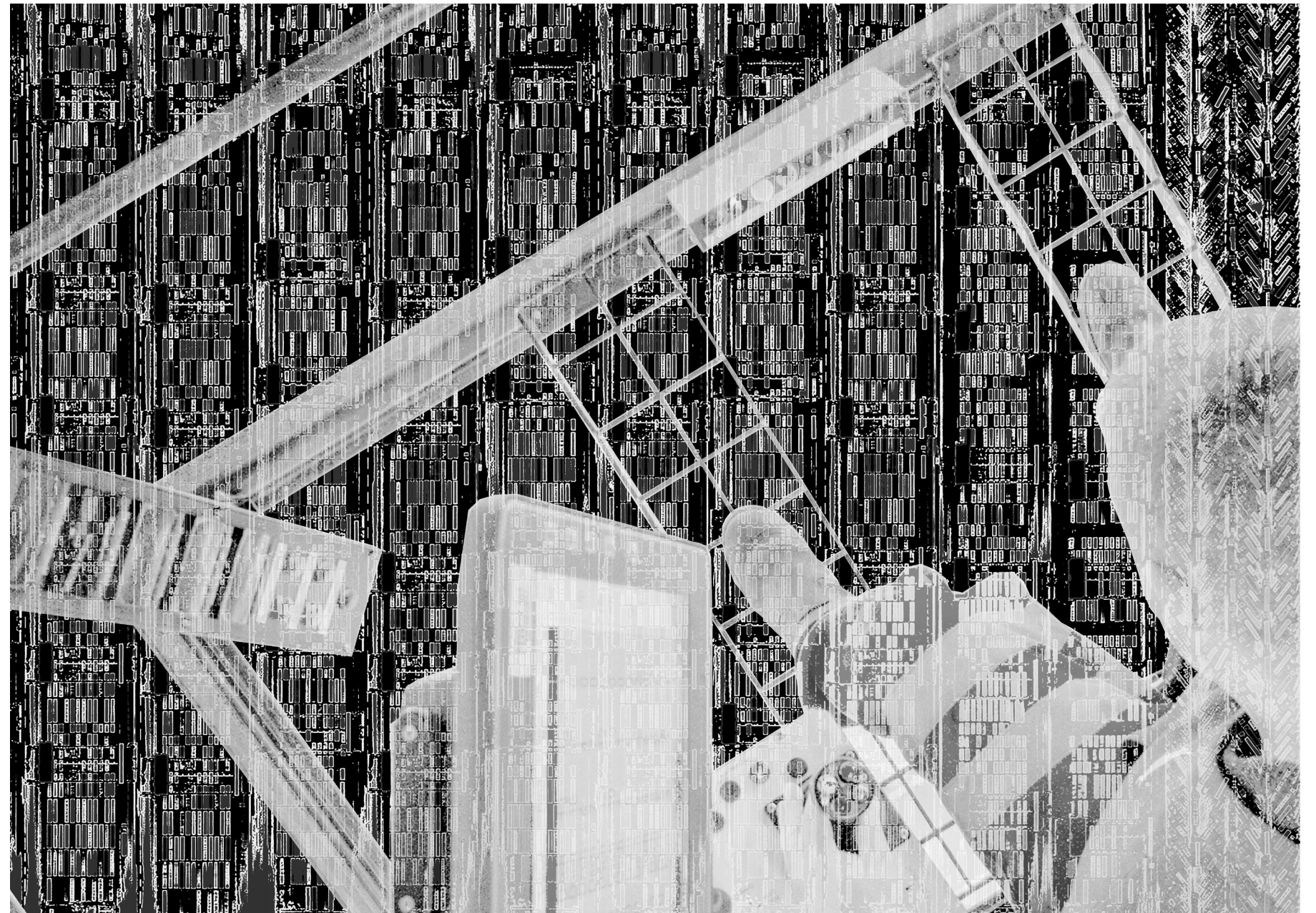
d. Theoretical Approach and Framework

The Architectural research considers the productive infrastructure as what Martin Pawley suggests as "Terminal Architecture". As the built form surrenders to the will of global automated networks, it becomes a terminal no longer a building. How to design with the notion that "The real barometer of the value of buildings today is not their aesthetic pedigree, but their usefulness as terminals in the maze of networks that sustain modern life" (Pawley). Designing buildings as instruments and not monuments.

Looking at the building as an automaton. A machine that moves by itself or that has in itself the principles of its movements. But is it perhaps something that moves at the will of another? is this productive infrastructure the frontline between these global networks in which humans now look upon from above, from the control room somewhere else, or from the computer screen kilometers away?

Research Questions

1. INVESTIGATING THE RELATIONSHIP BETWEEN INFRASTRUCTURAL FORM, FUNCTION AND AUTOMATION
2. WHAT ARE THE EFFECTS OF THE INTRODUCTION OF THE AUTOMATED INFRASTRUCTURE INTO PORT LANDSCAPES?
3. HOW CAN STRUCTURE, STORAGE AND FAÇADE BE COMBINED INTO ONE MODULAR ELEMENT THAT DEPICTS THE PROCESS WITHIN?



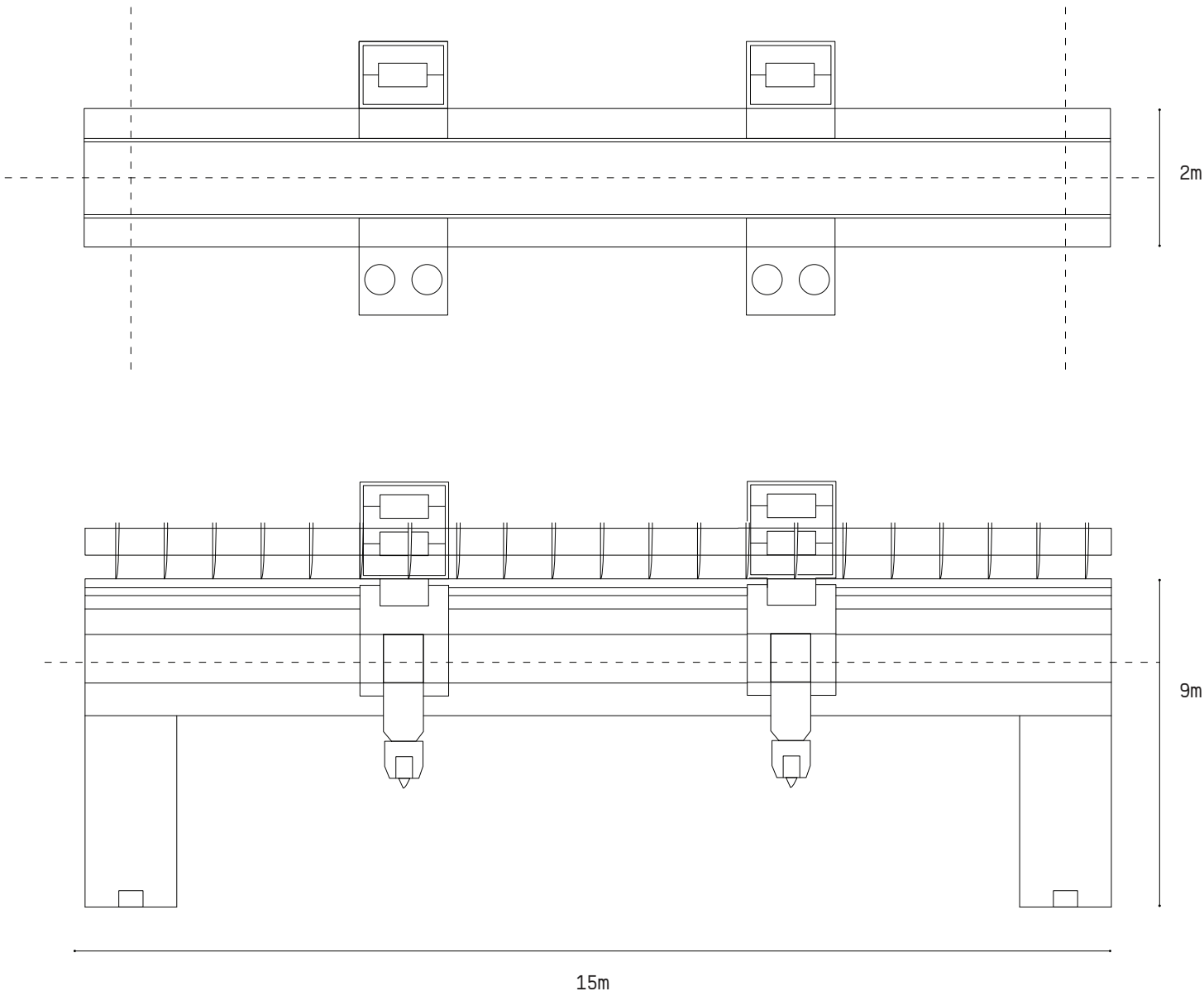
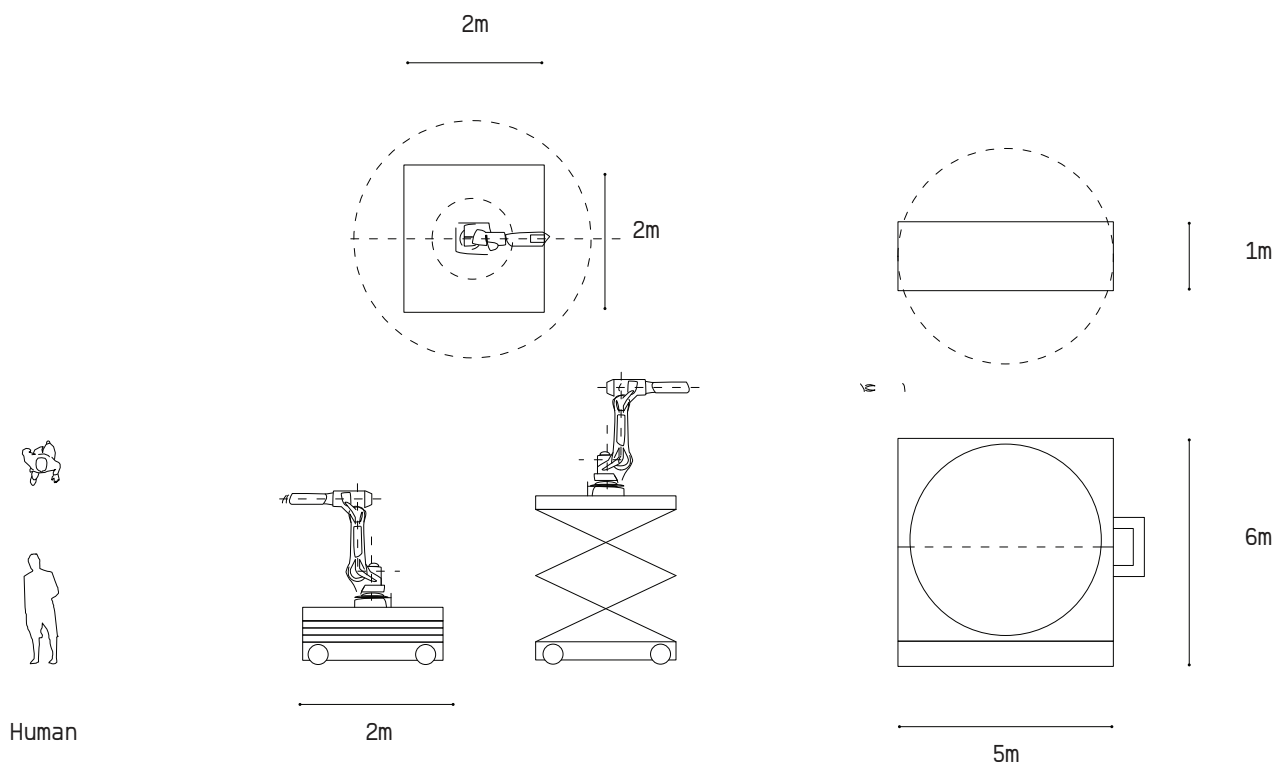
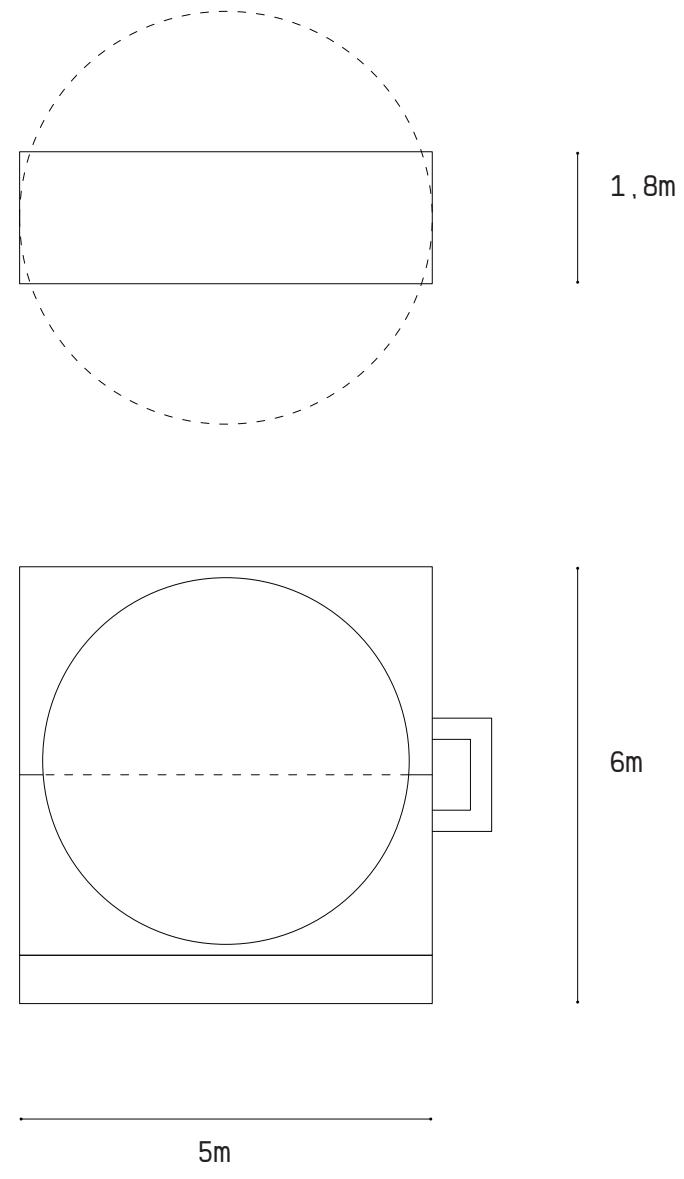
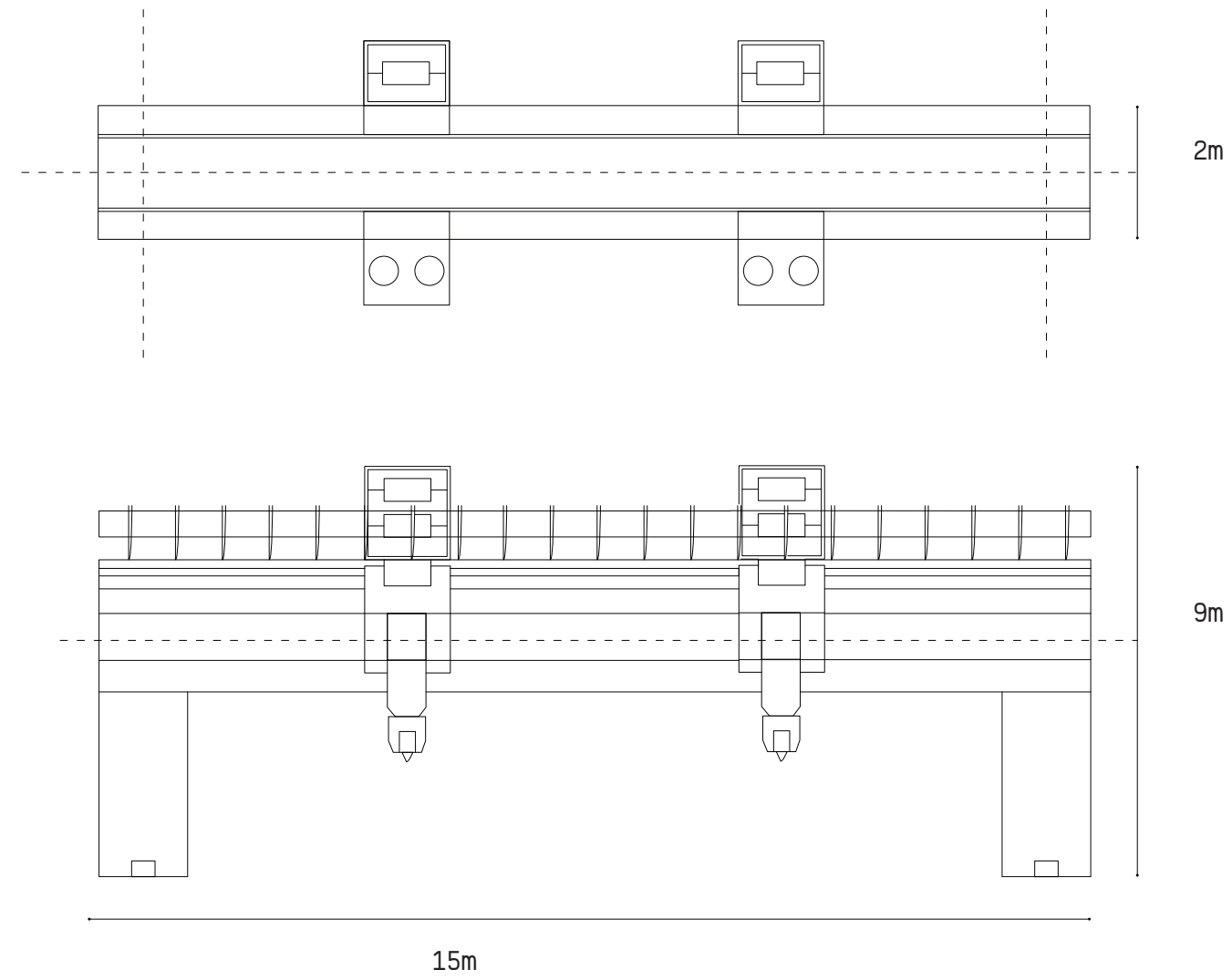


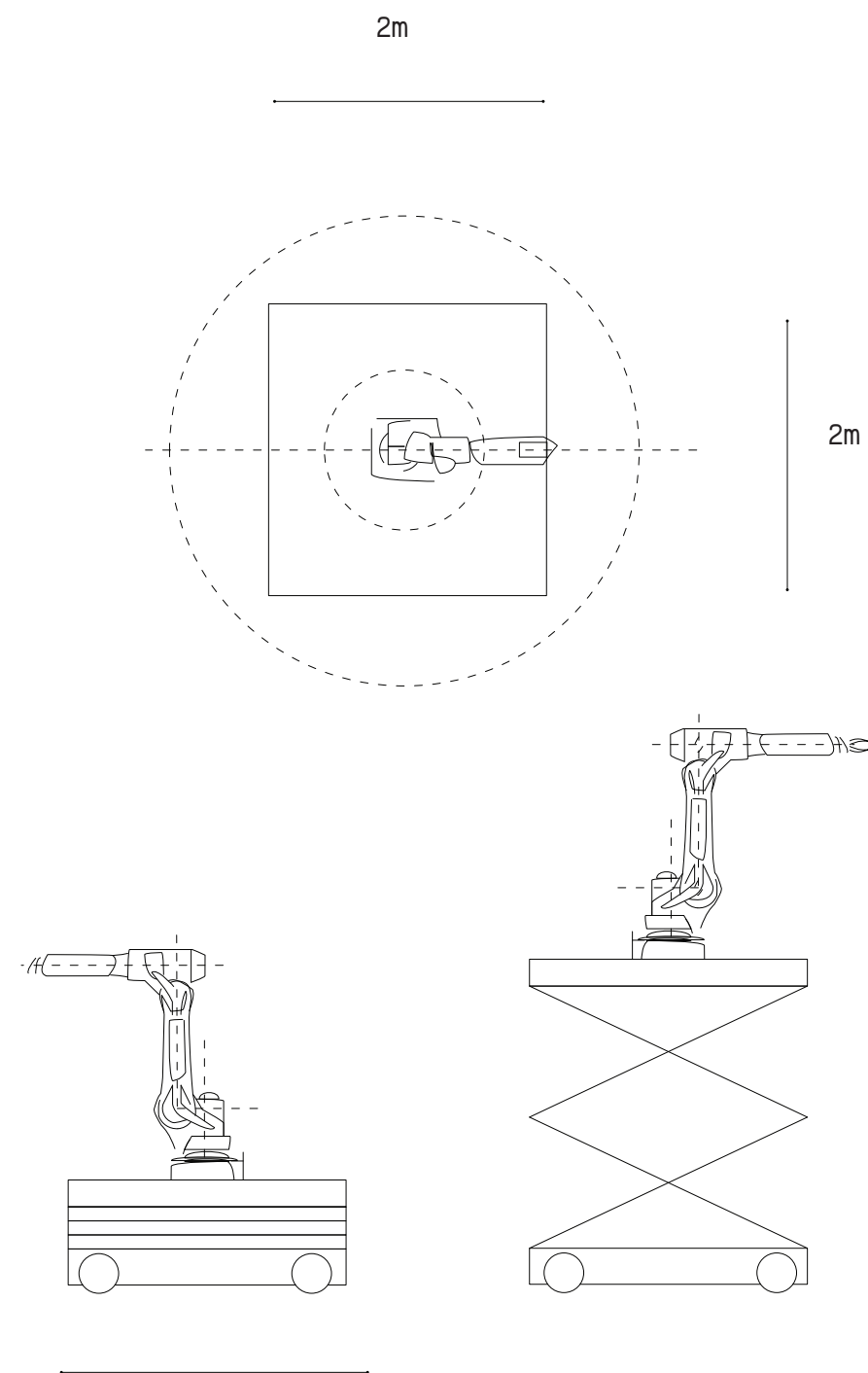
Image: Human to Machine Scale Comparison



The Machines (Blade Hold-
er)



Mastermill Prototype

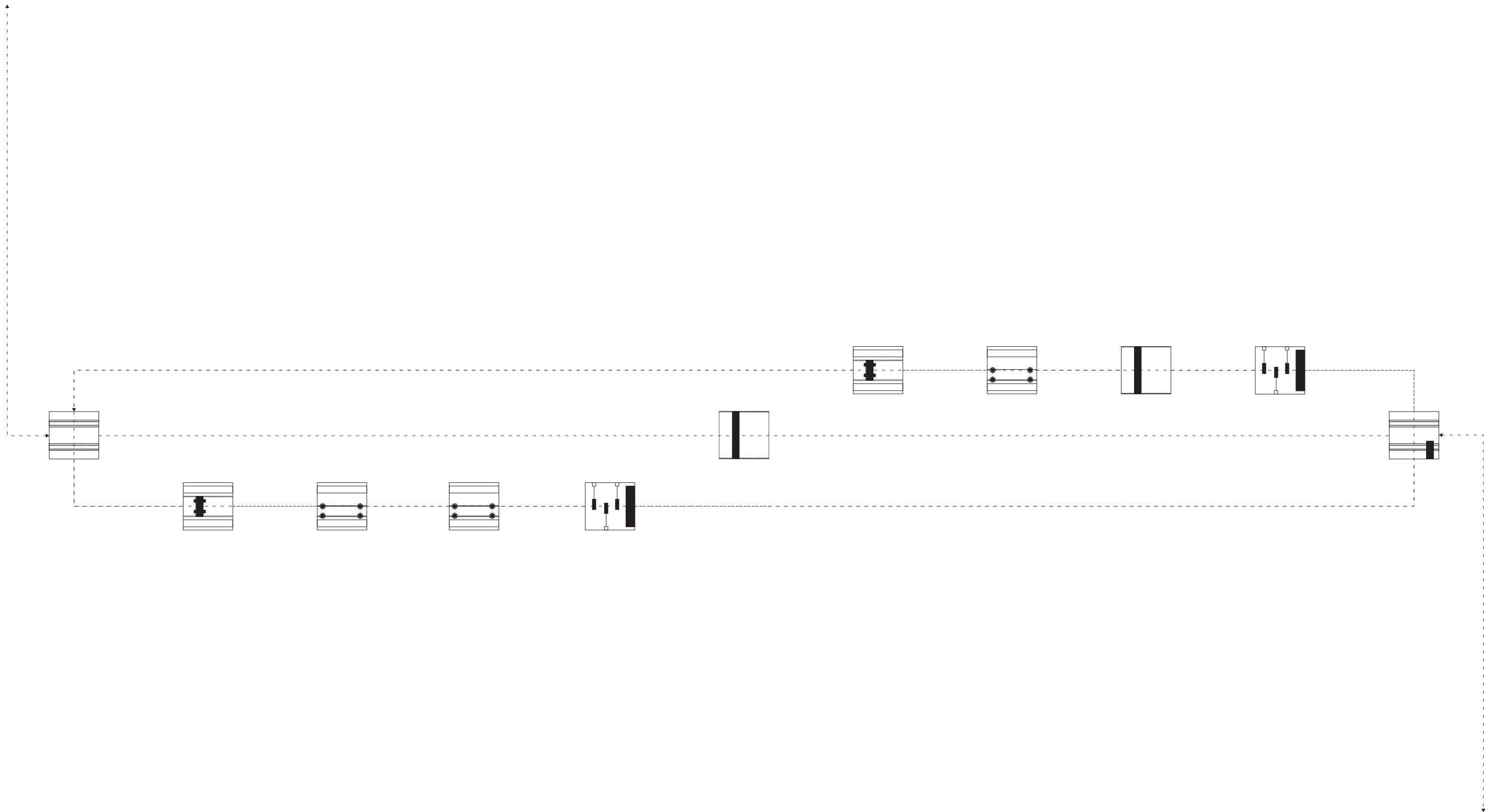


Kuka omnimove and robotic Arm

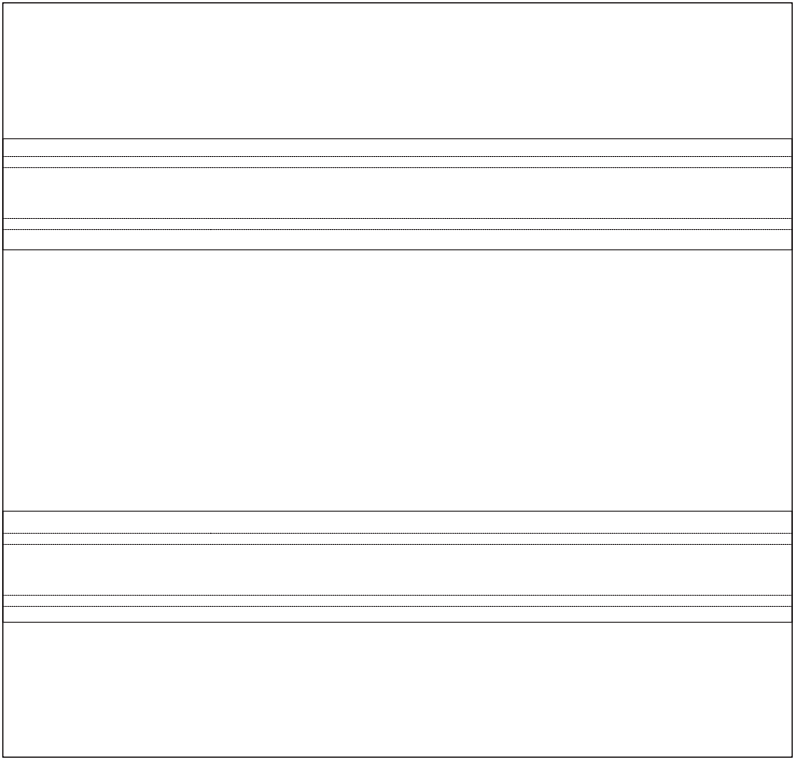
Action/ Space/ Machine Sequence

The research began with the investigation of movement between process and the machine that governs it. by creating this sequence an order is created that can be translated into the routing of the building.

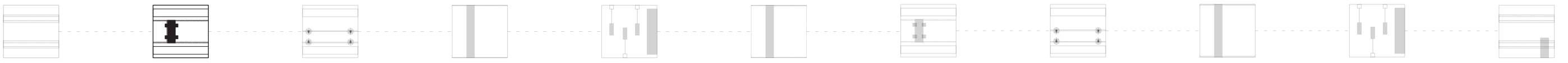
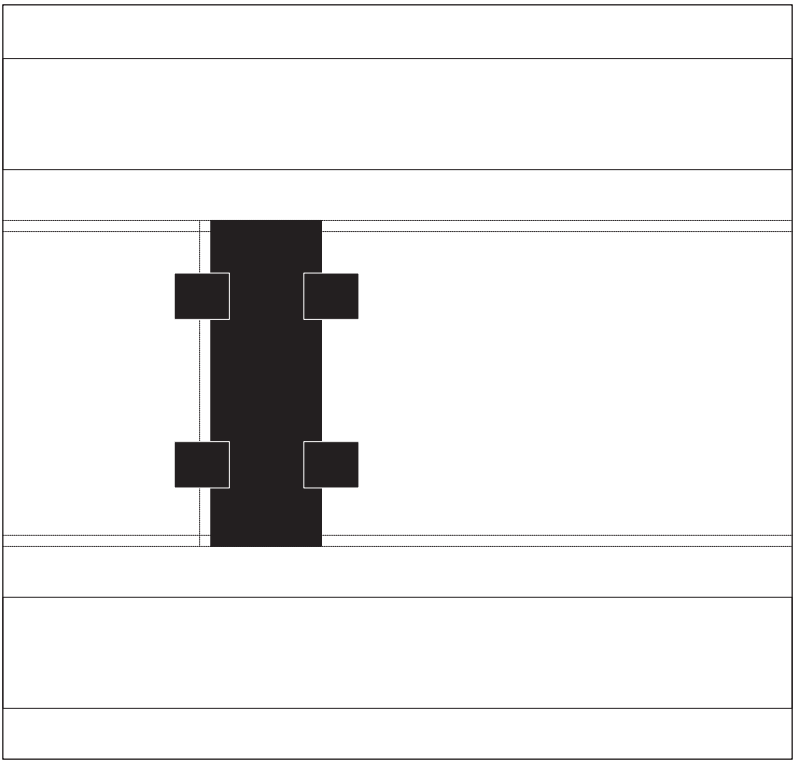
This is the abstraction of the process



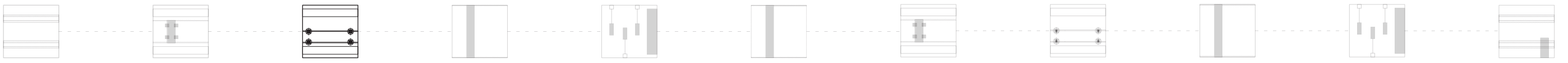
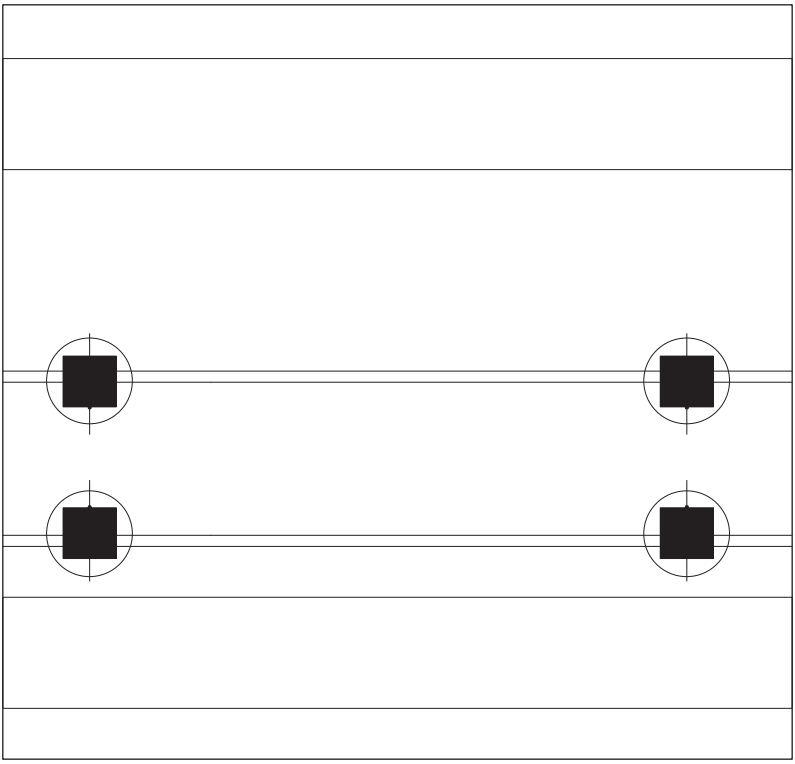
Sequence of Actions and Spaces: From production to maintance to destruction



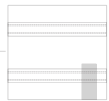
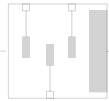
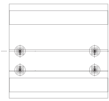
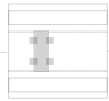
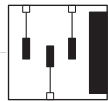
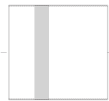
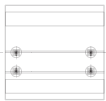
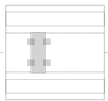
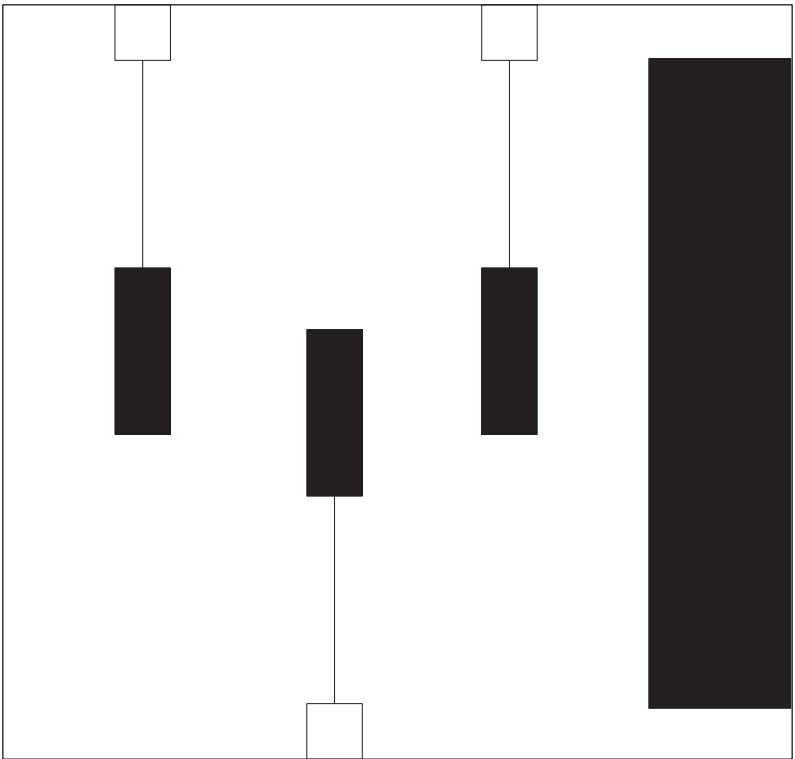
Material Input: Train Rail



Molding : Mastermill



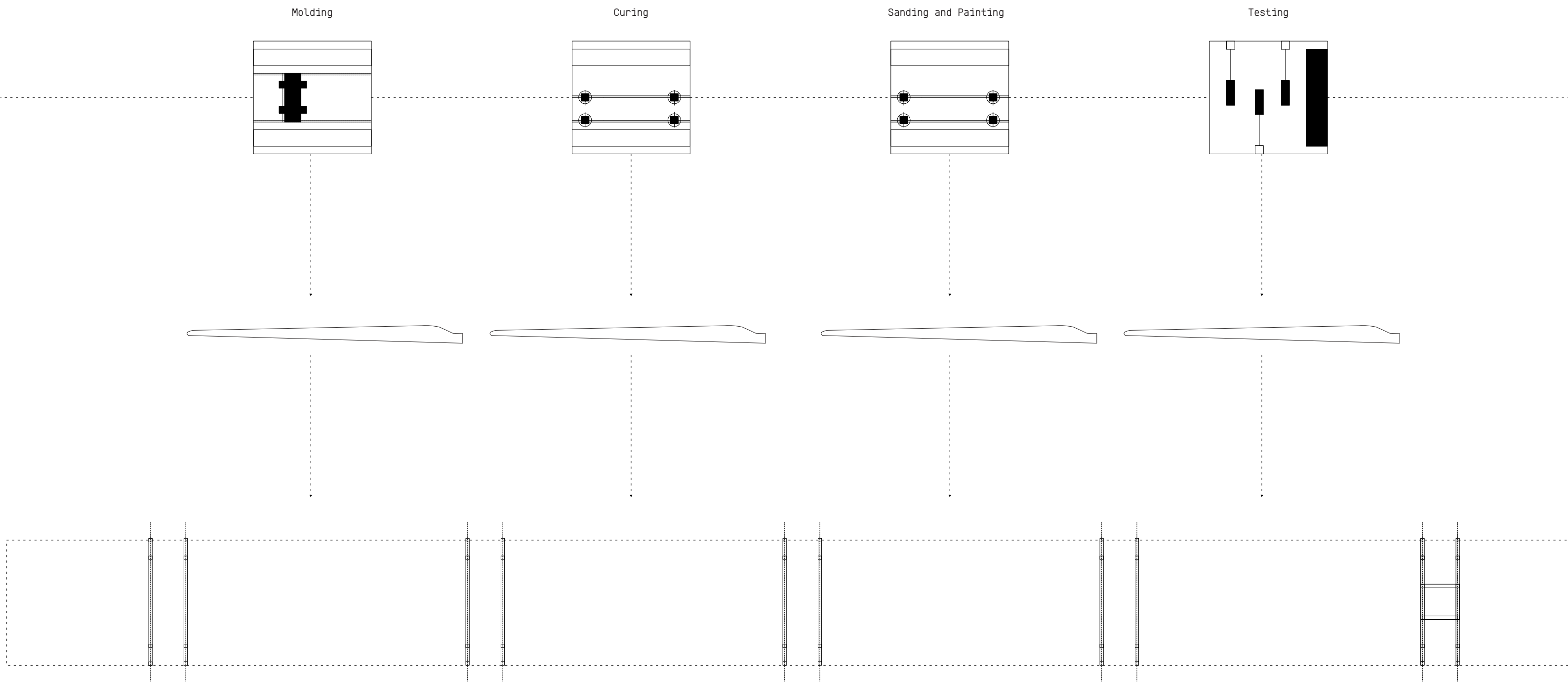
Epoxy Curing and Painting : robotic
arms



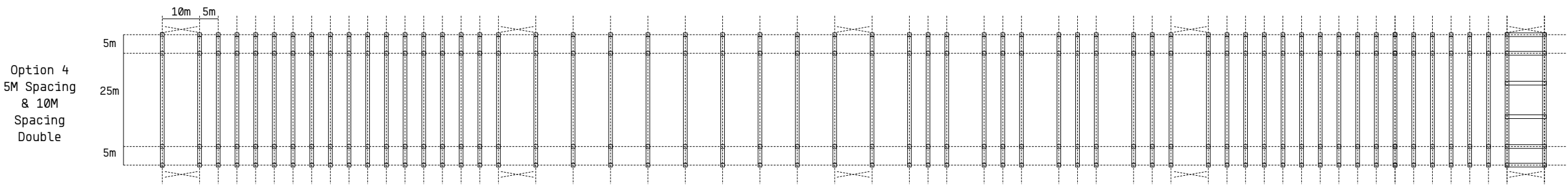
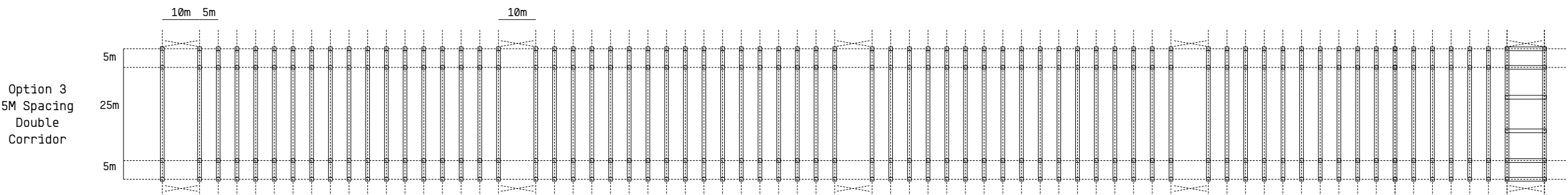
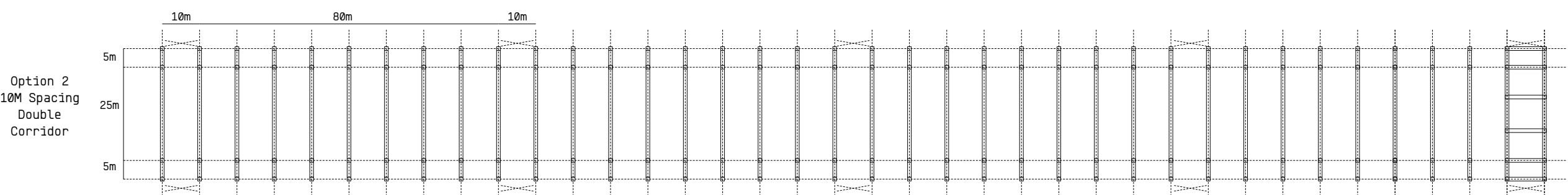
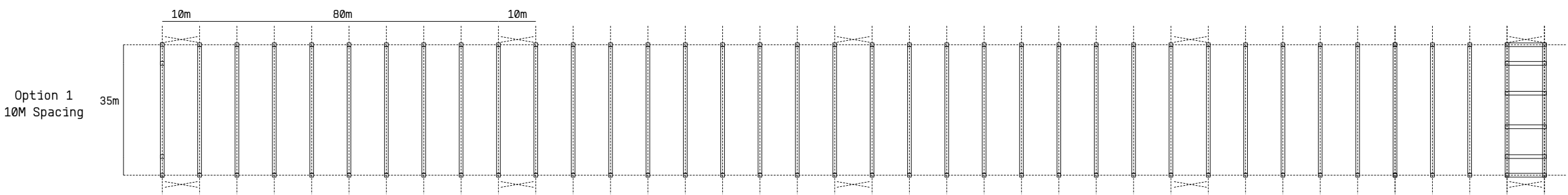
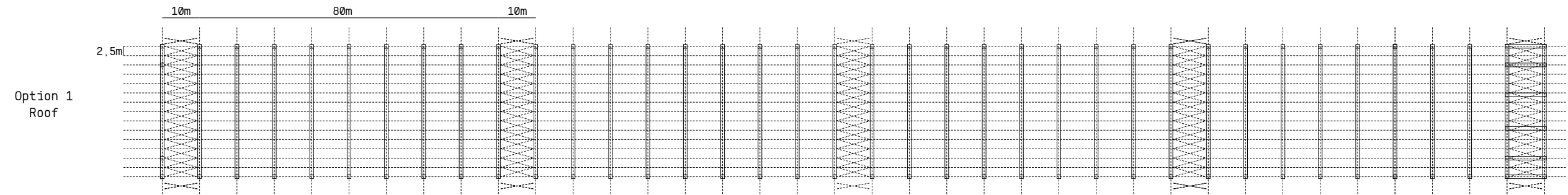
Testing and Pack-
ing

Floorplan Translation

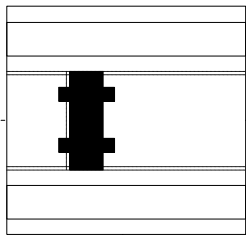
The action sequence was then translated into floorplans by adding the dimensions to the automaton and the dimension of the blade, 75m determined the minimum length of one process. In order to account for additional movement around the machines and the blade the overall process becomes 80m long with a buffer zone of 10m on each end.



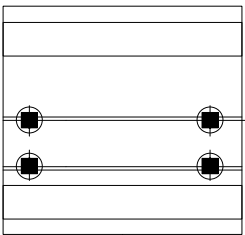
From Action to Containment



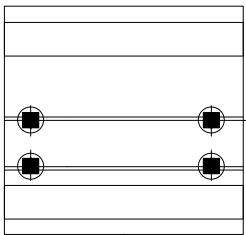
Molding



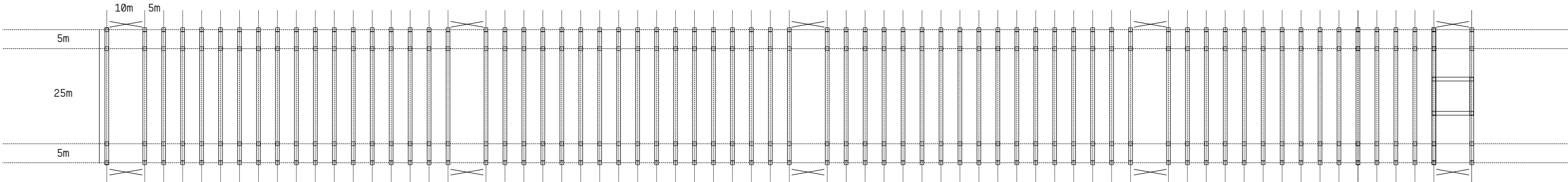
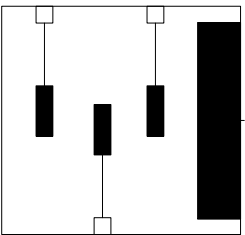
Curing



Sanding and Painting



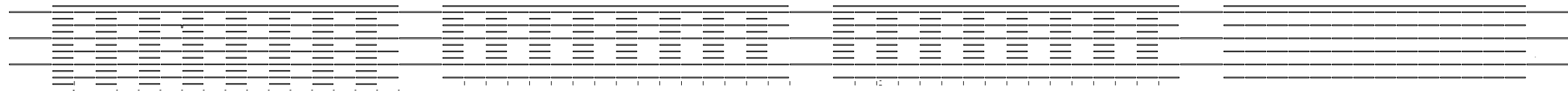
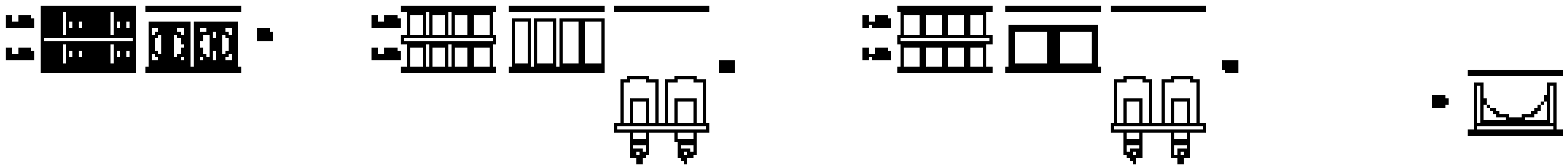
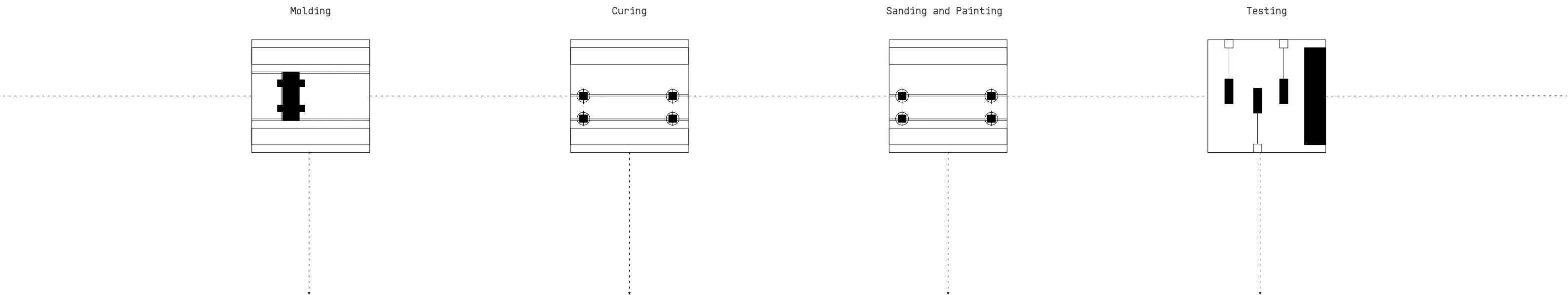
Testing



Grid Composition vs Action

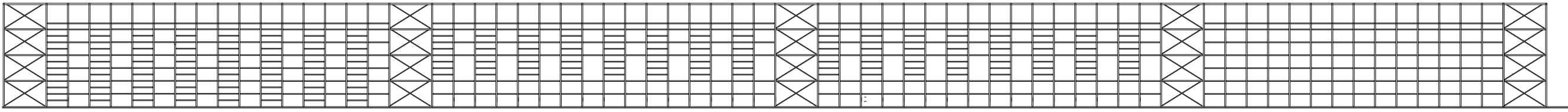
Elevation Scoring

The Elevation is then Scored in Accordance to the objects involved in each process. Leading to a facade that becomes an exhibition of the elements used within the interior automated space.

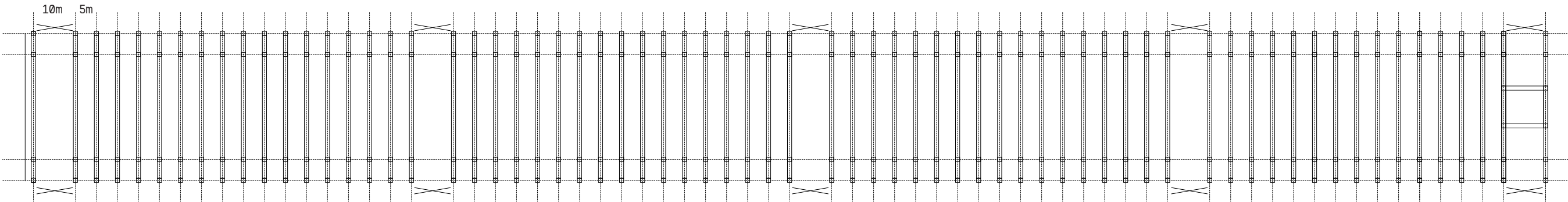


Objects involved in process





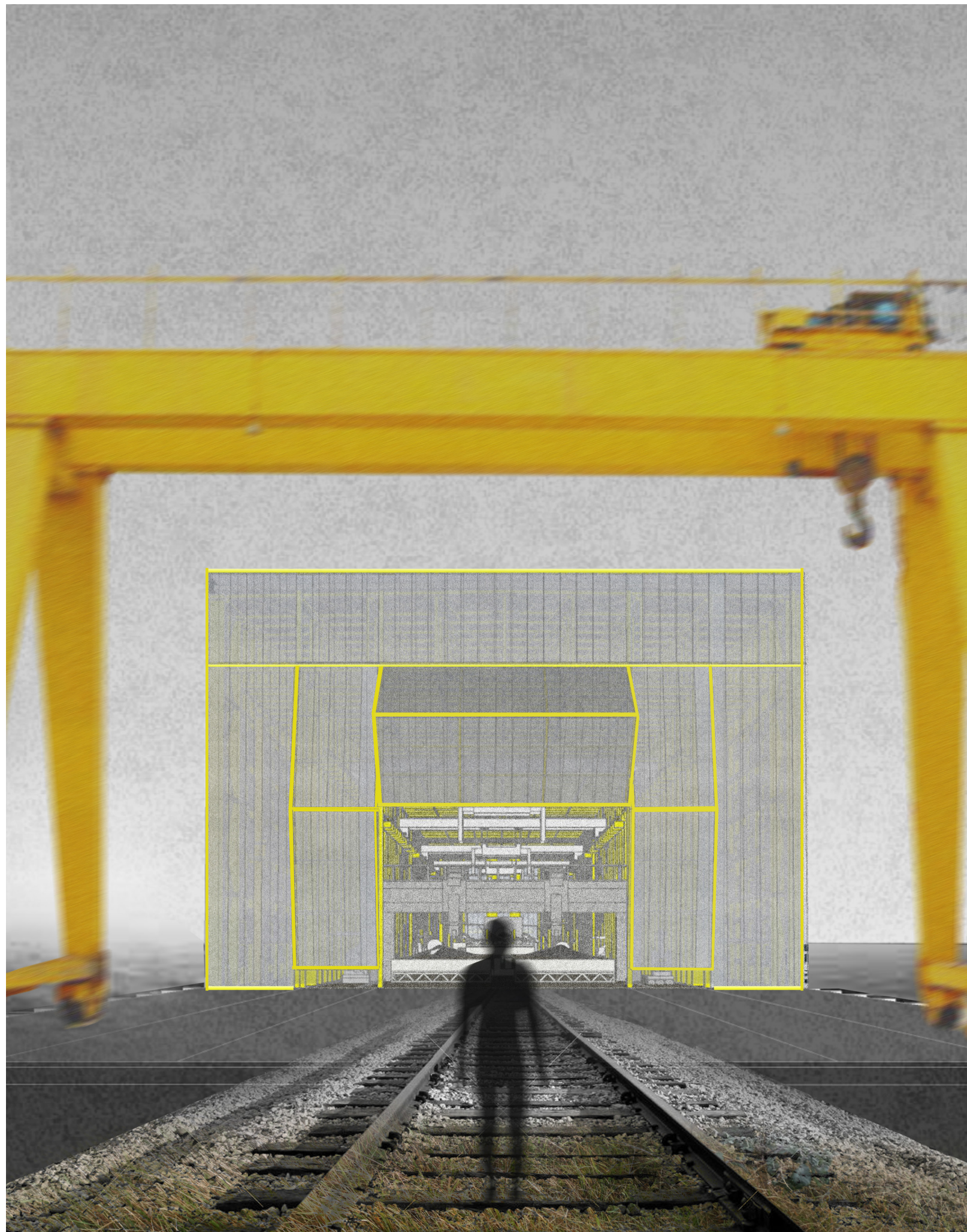
Elevation Scoring

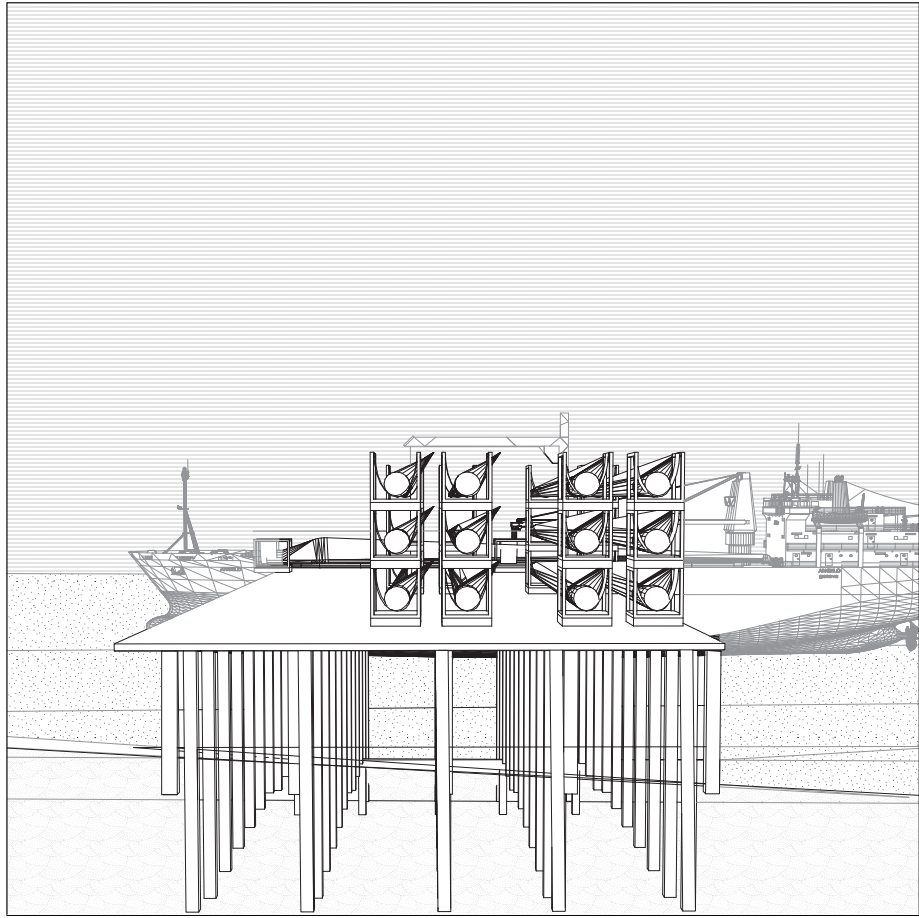
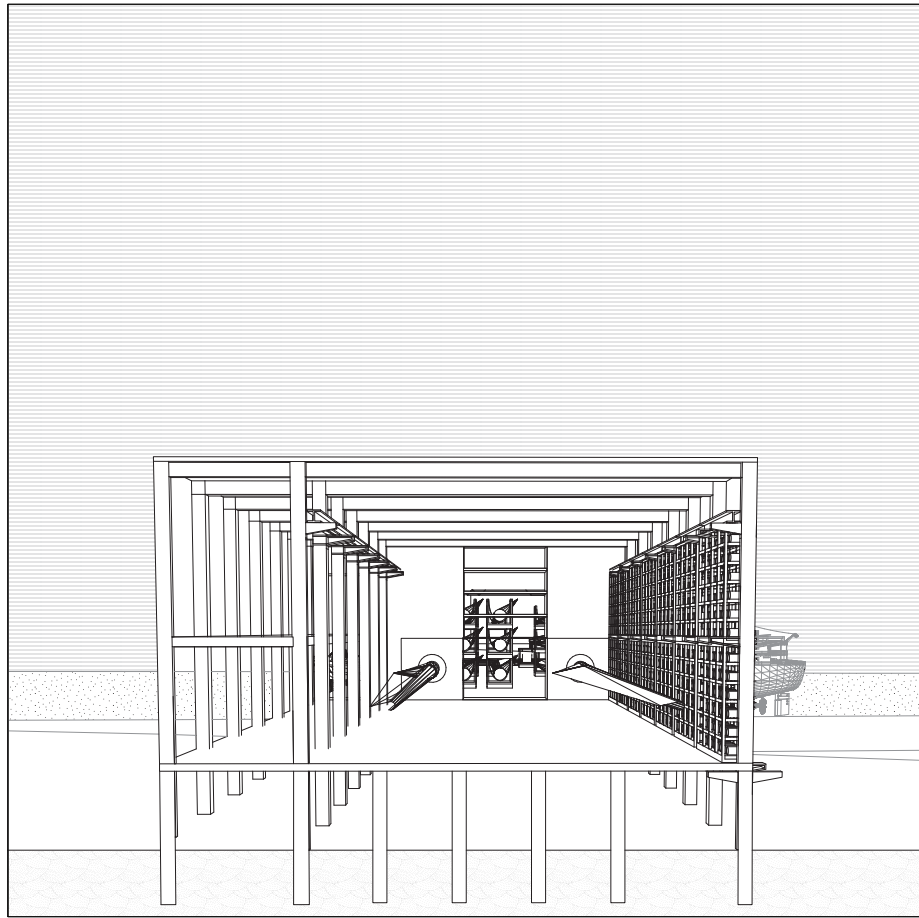
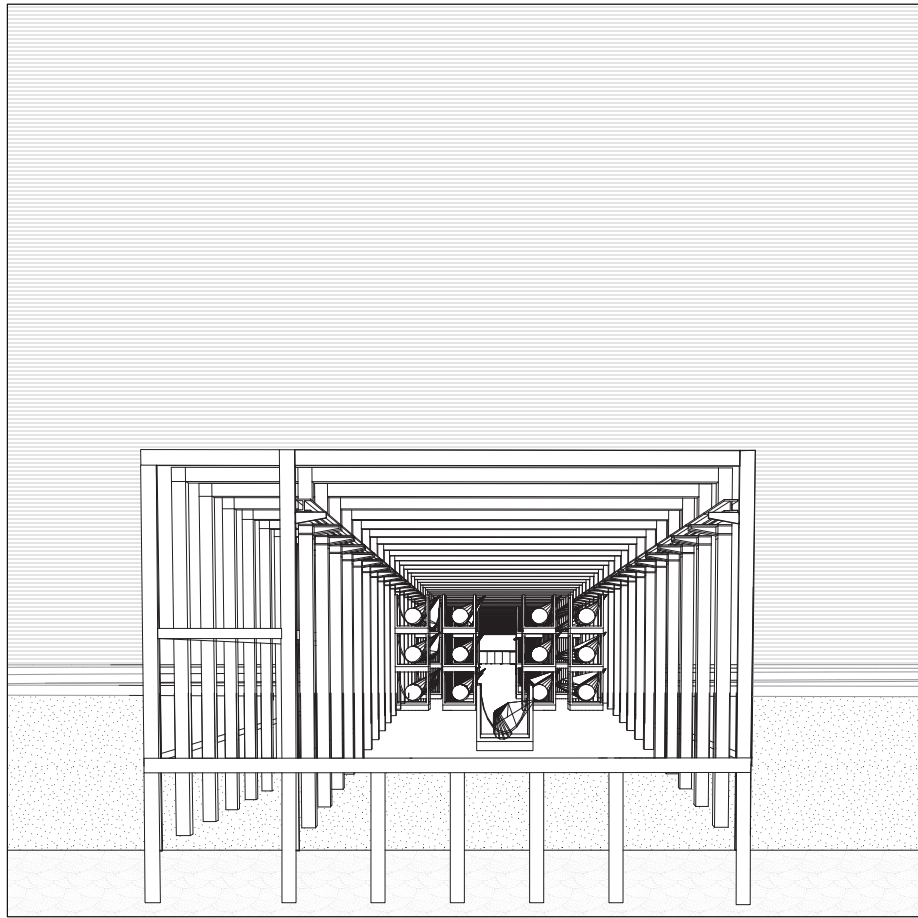
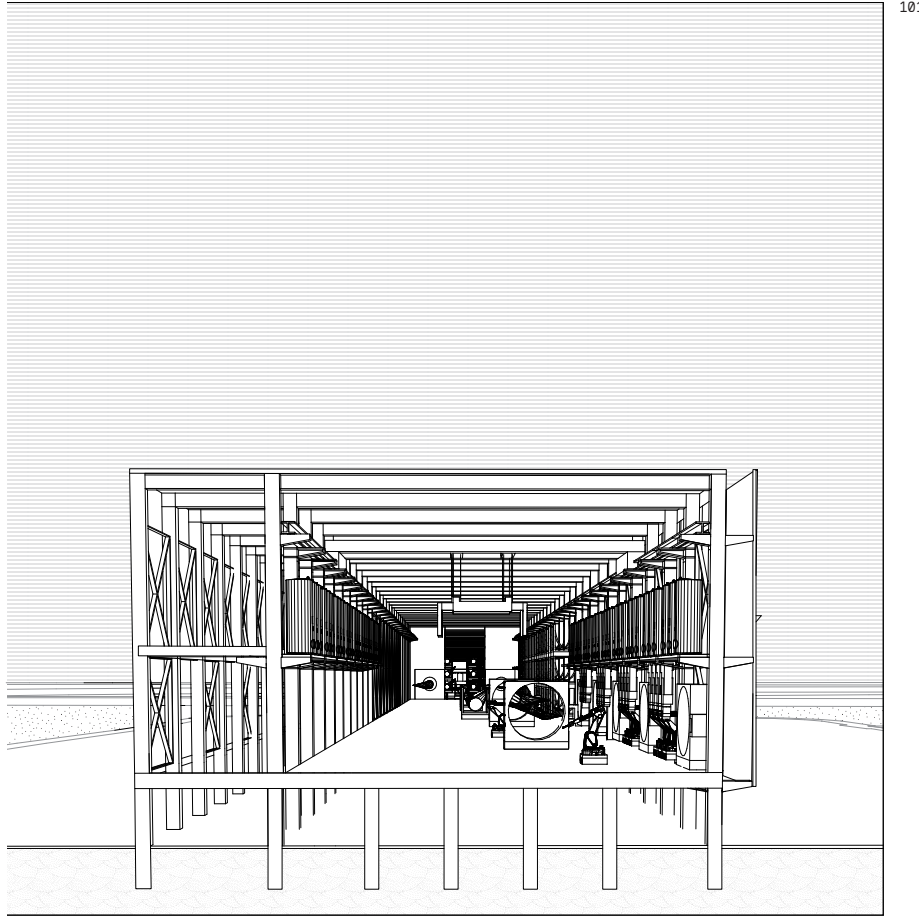
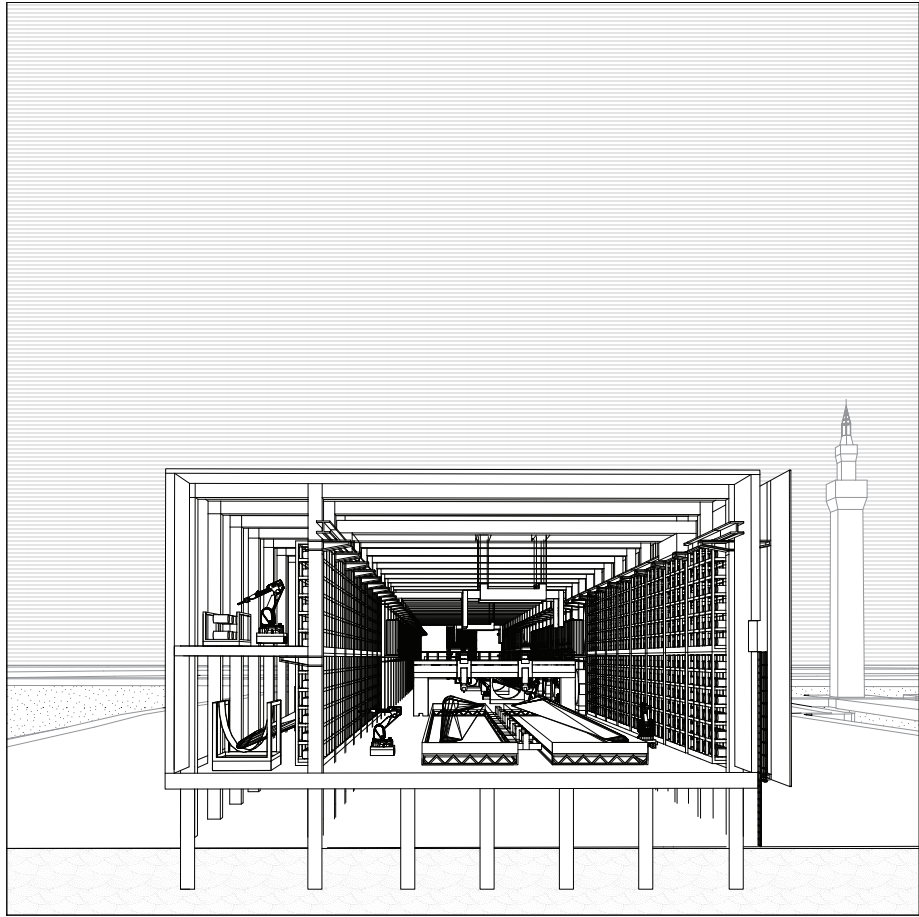
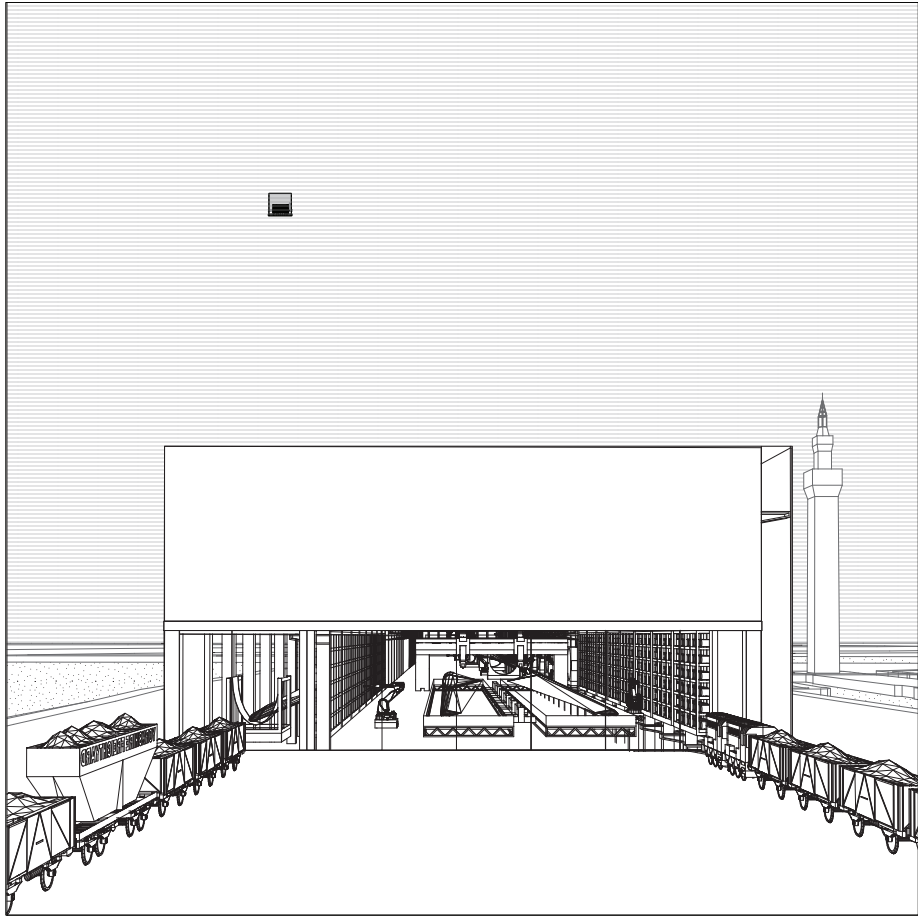


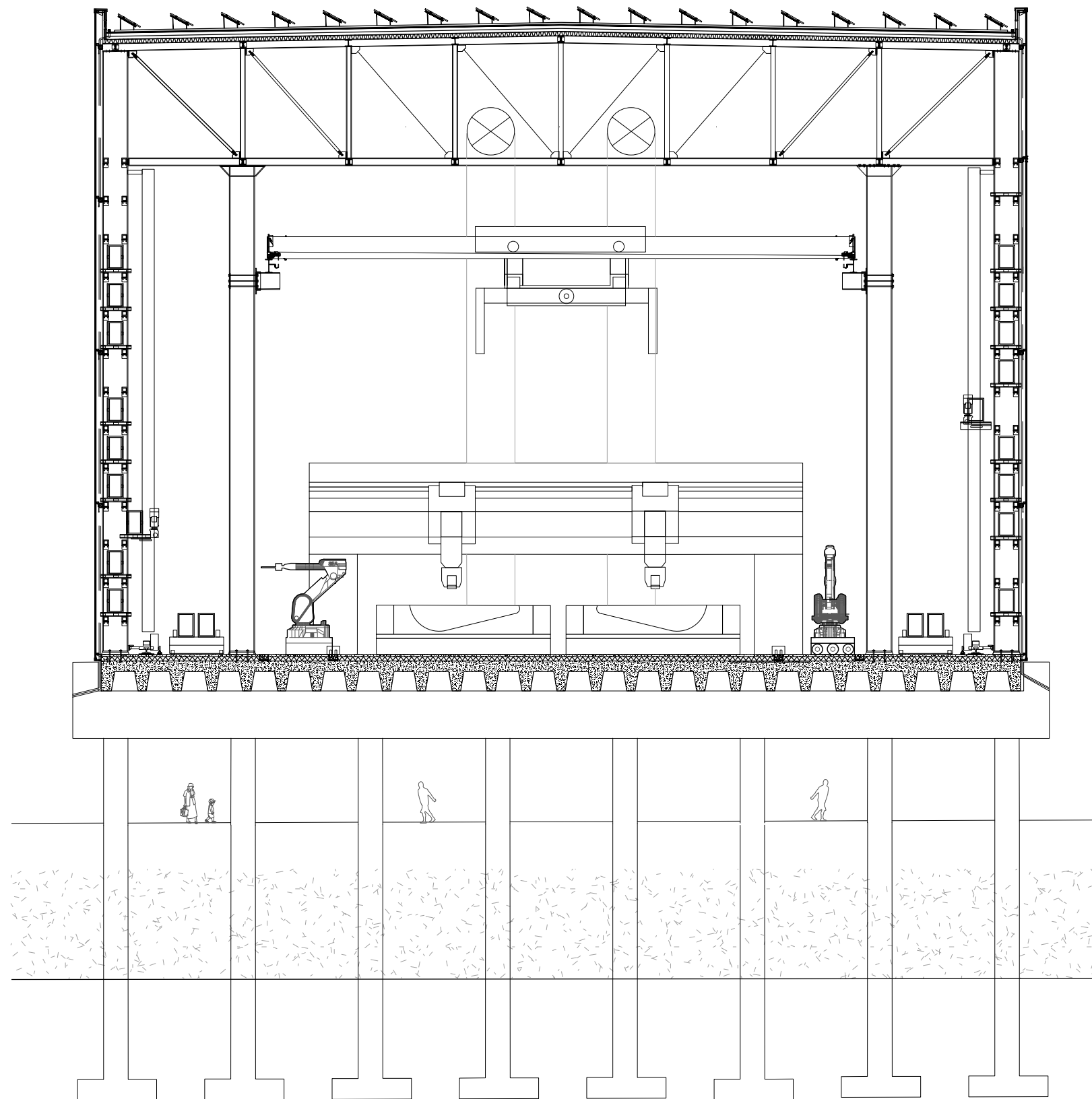
Floorplan Scoring

Introduction of the Machine

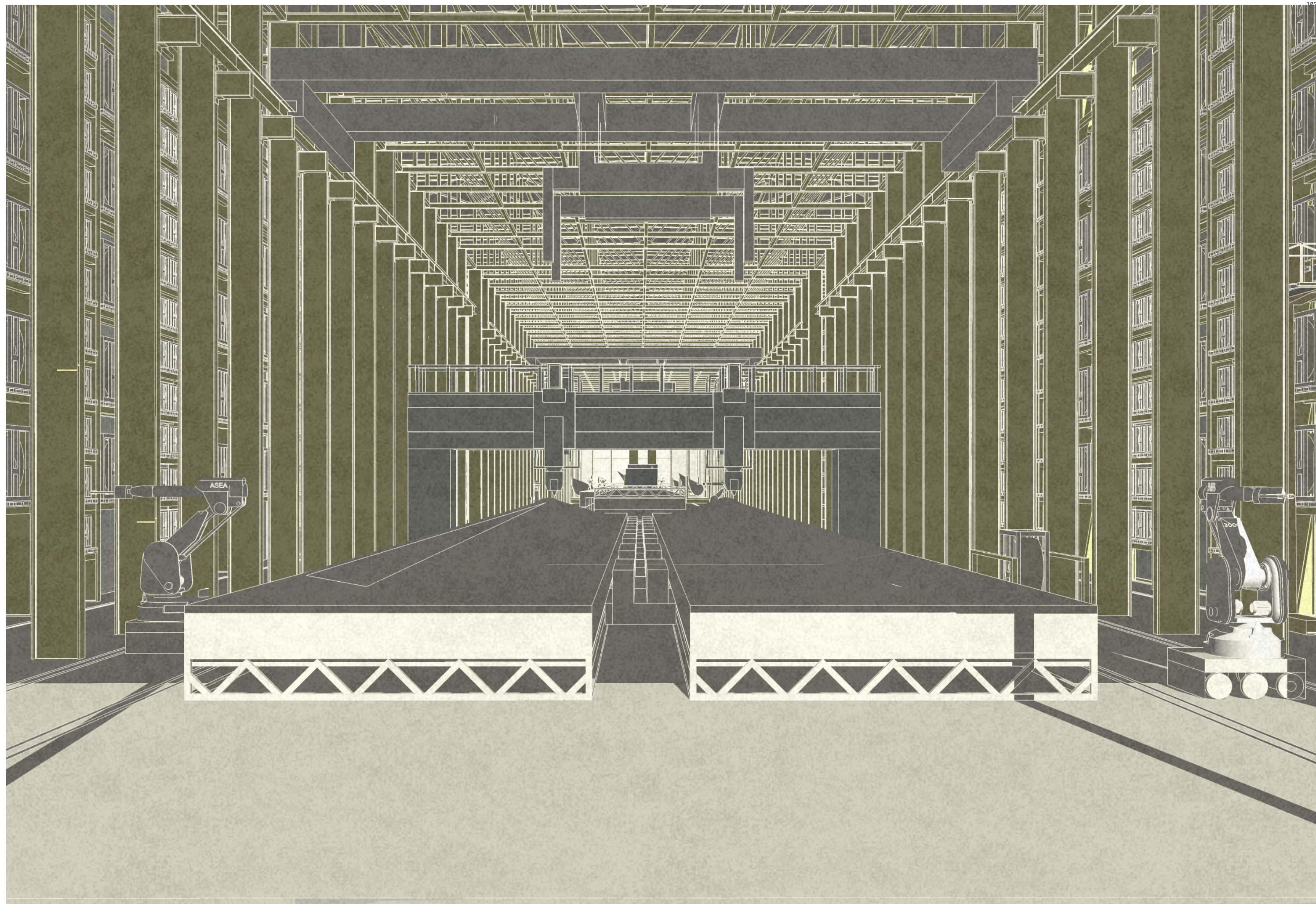
The Container is given Life, The scoring is converted into a functional grid. The line is split in three bands. A central band where the production takes place, and two bands that follow it on either end where the storage occurs. A series of elevation tests show the need the three bands to be translated into section as well, to allow for machines on all levels to flow freely.

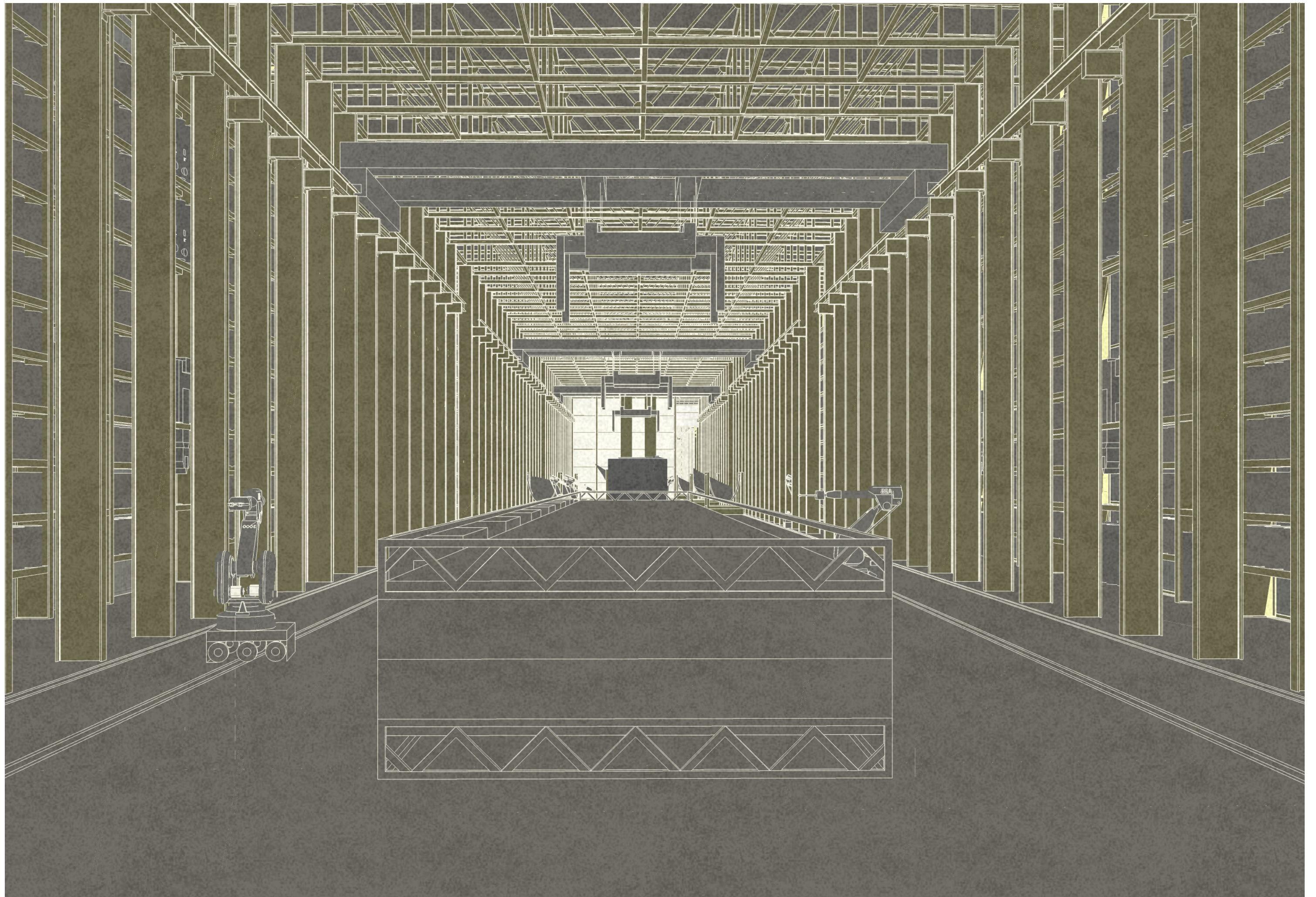


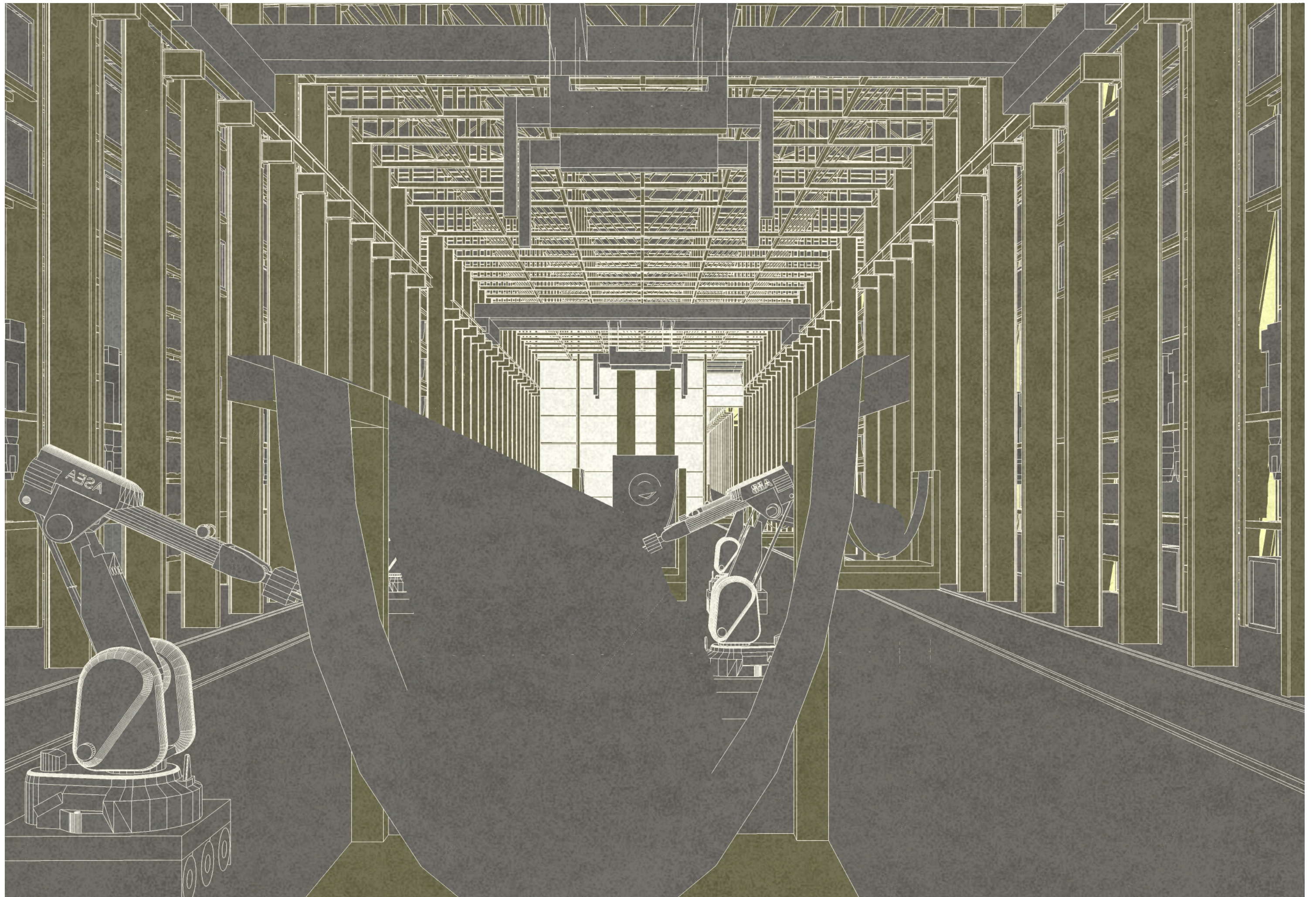


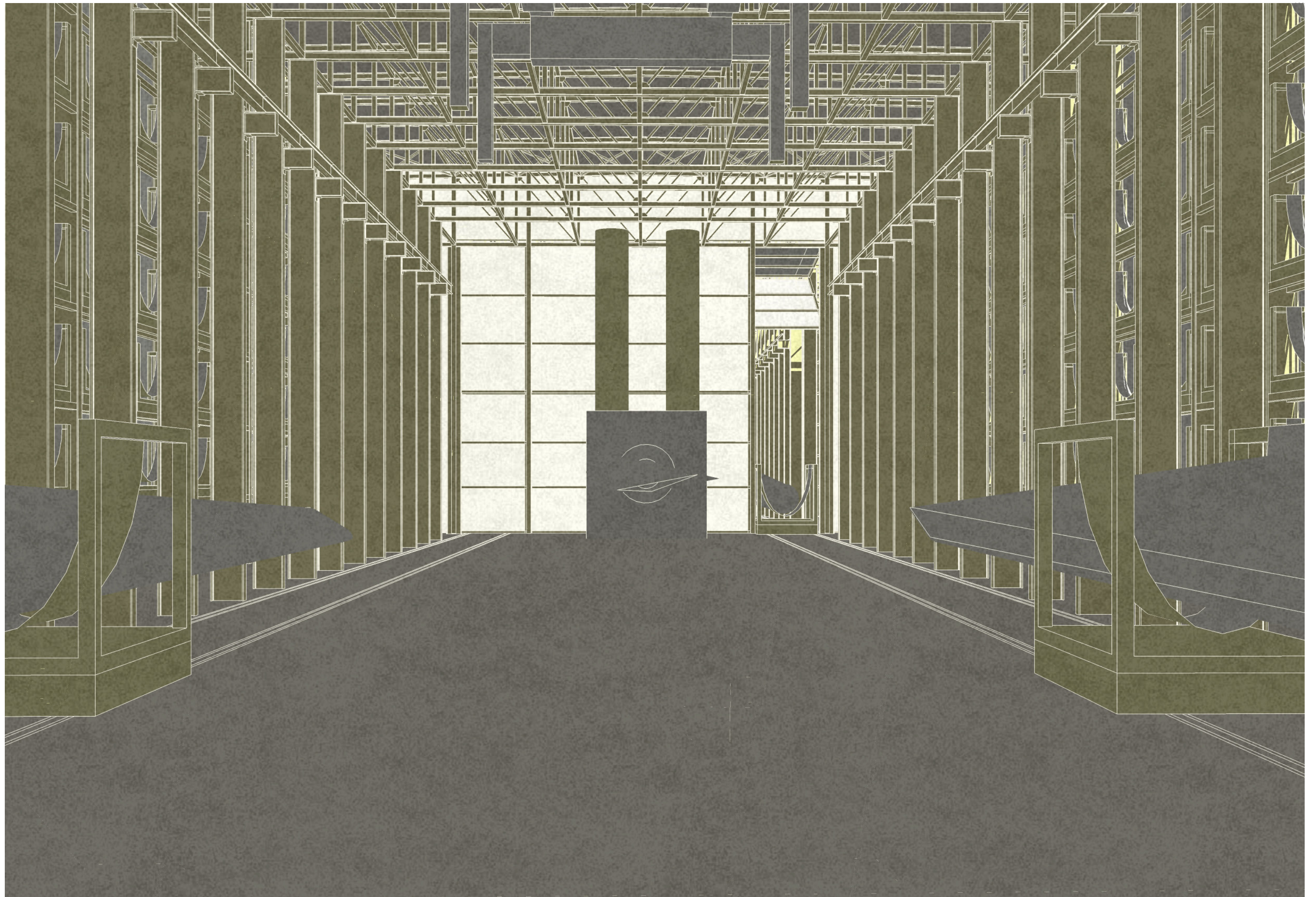


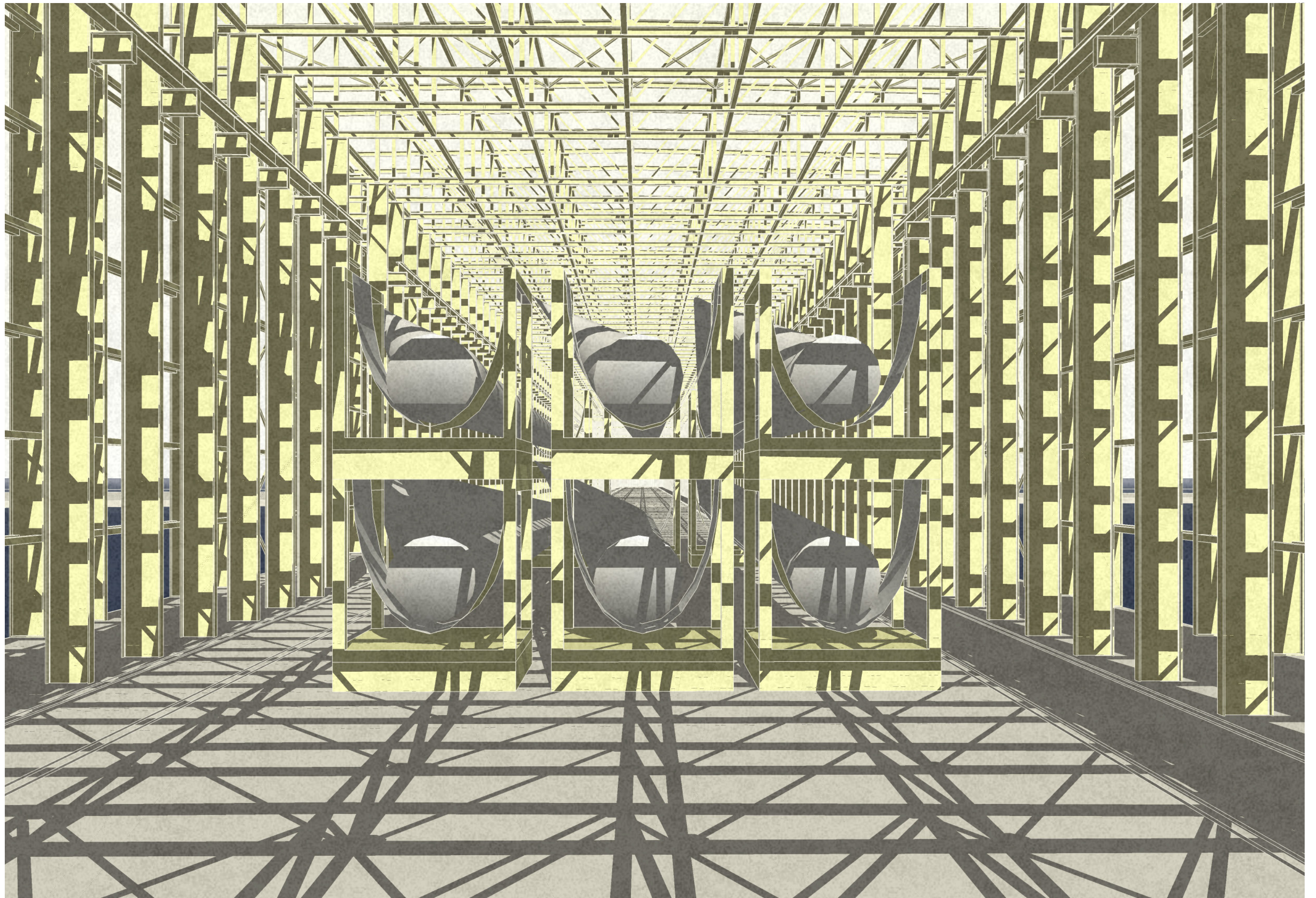
Short Cross Section
1:200

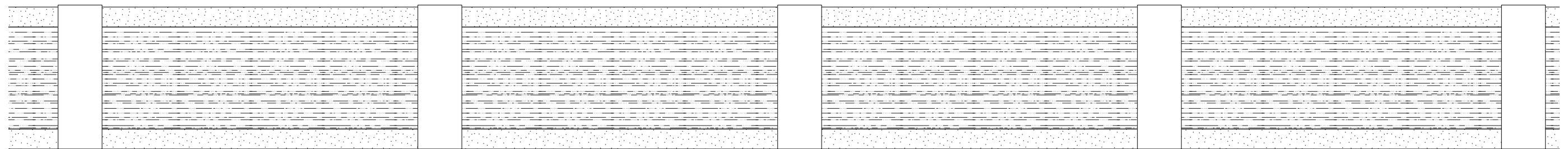


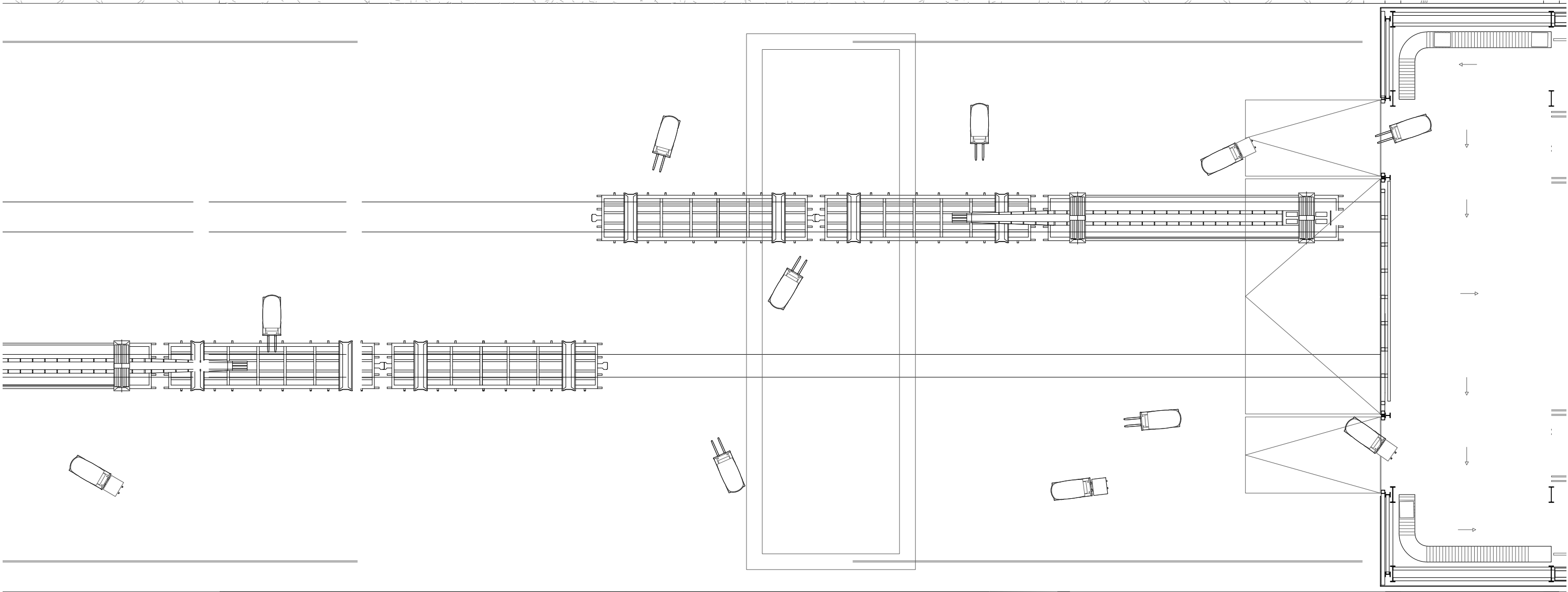






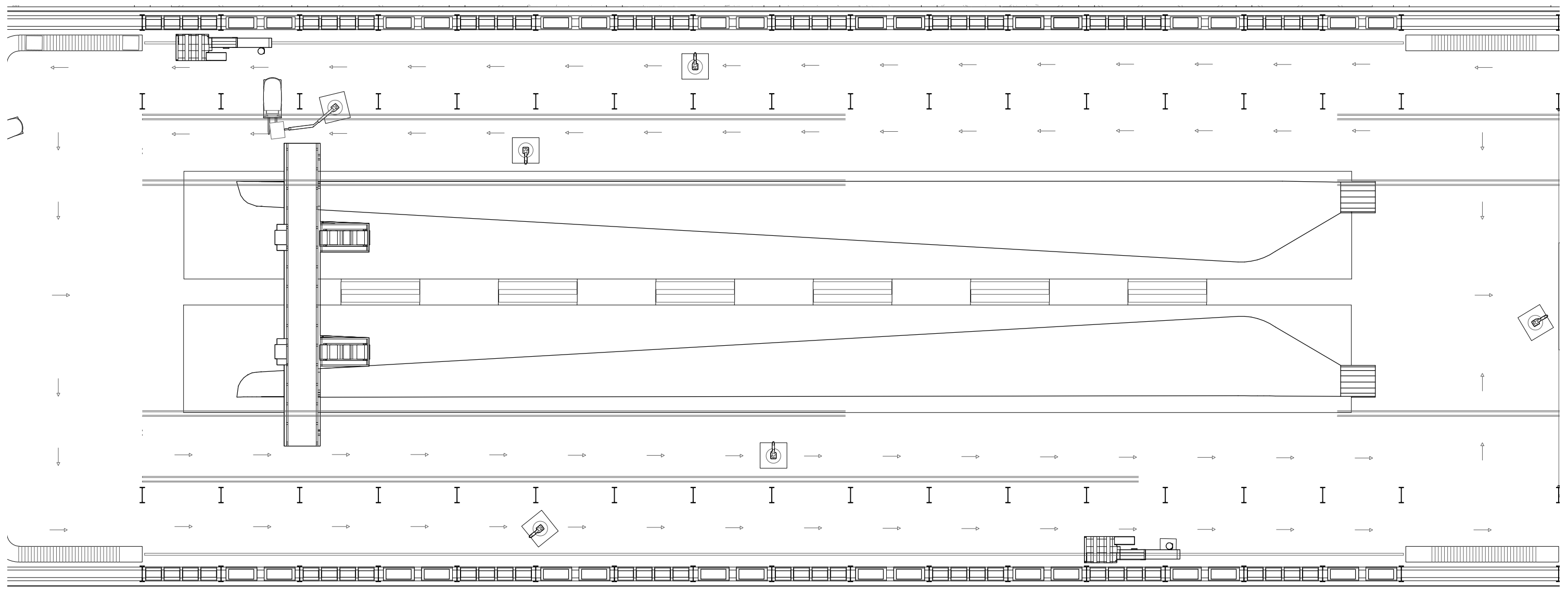






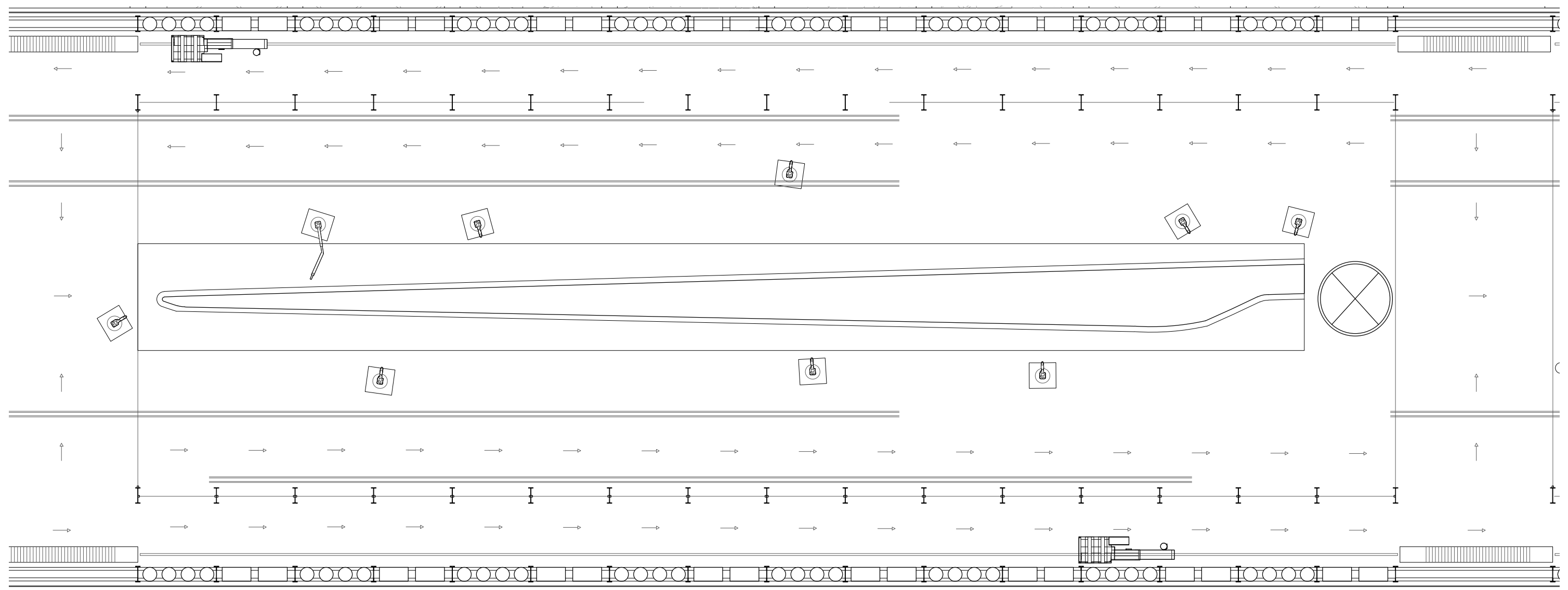
Floorplan Entrance
1:250





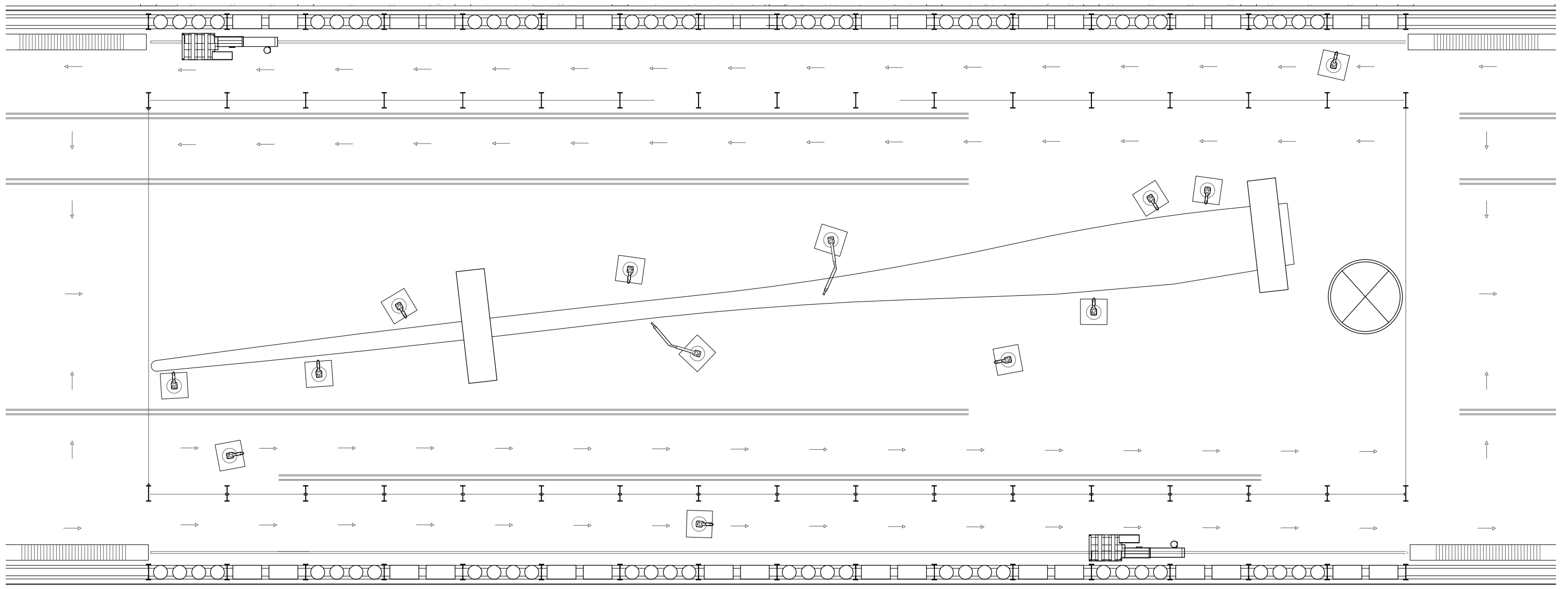
Floorplan Molding
1:250





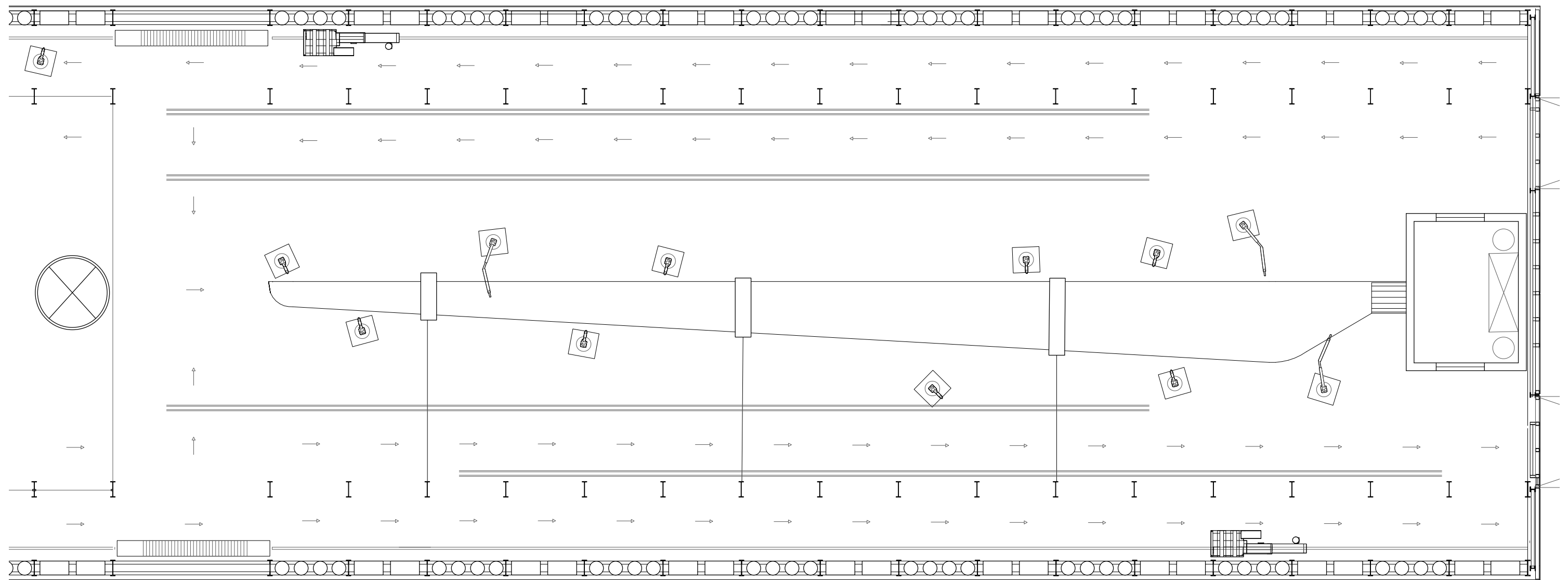
Floorplan Curing
1:250





Floorplan Painting
1:250



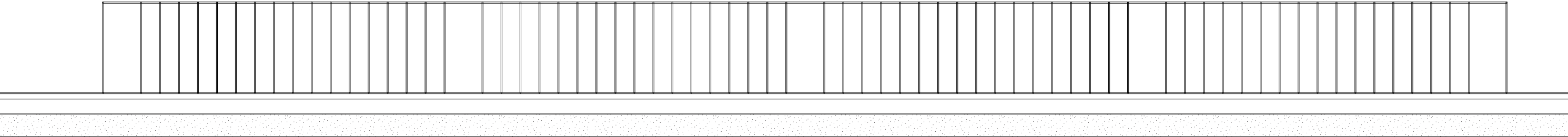


Floorplan Testing
1:250

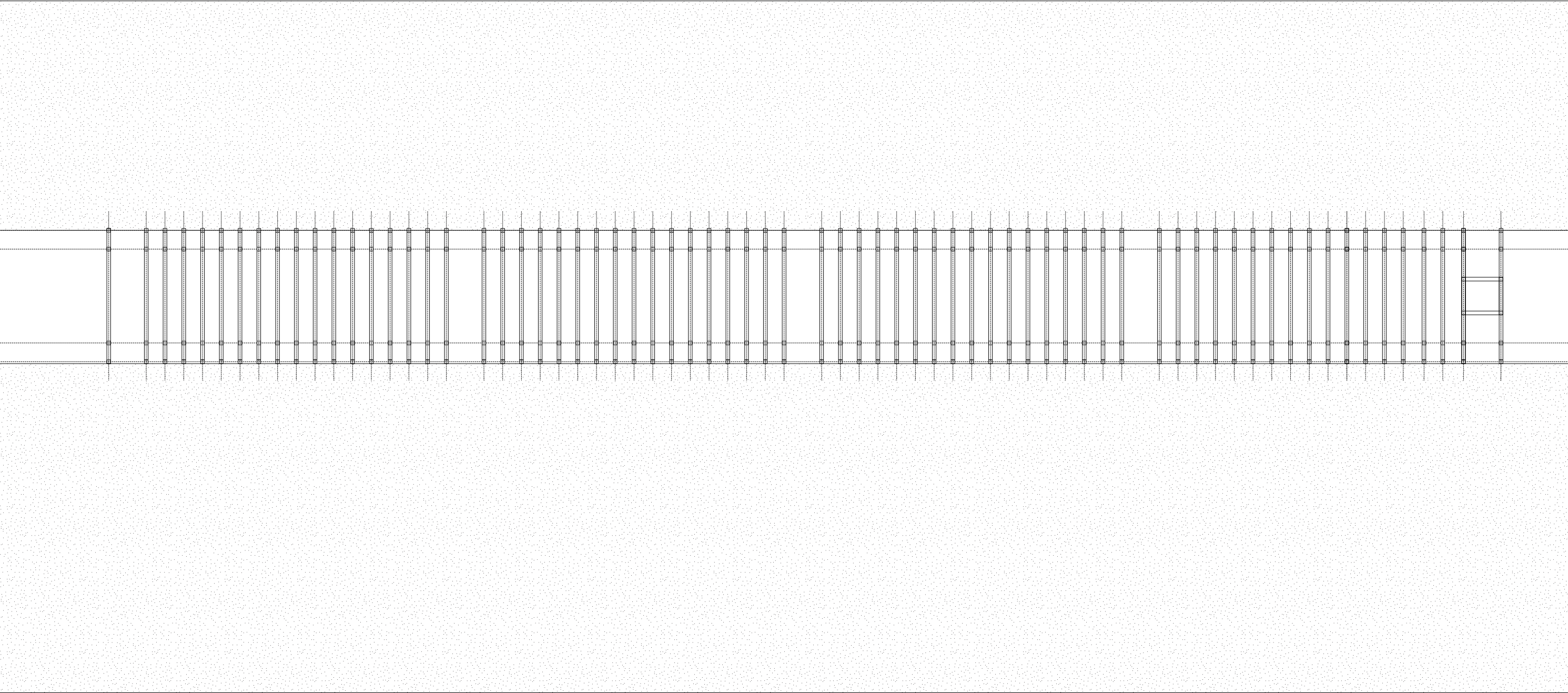


Grounding

The Container is then placed 5m above ground, and the new coastline is formed through the formation of tidal basins that function both as flood defence and as a place for seating on the coast. The human is now the audience of the automated spectacle. Moments of pause in the production line reflect on the extension of the coastline out and under the building, a connection between land and sea is then further implied.

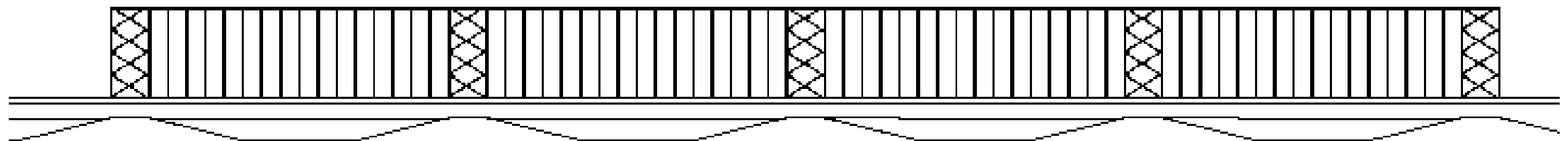


Section Elevation

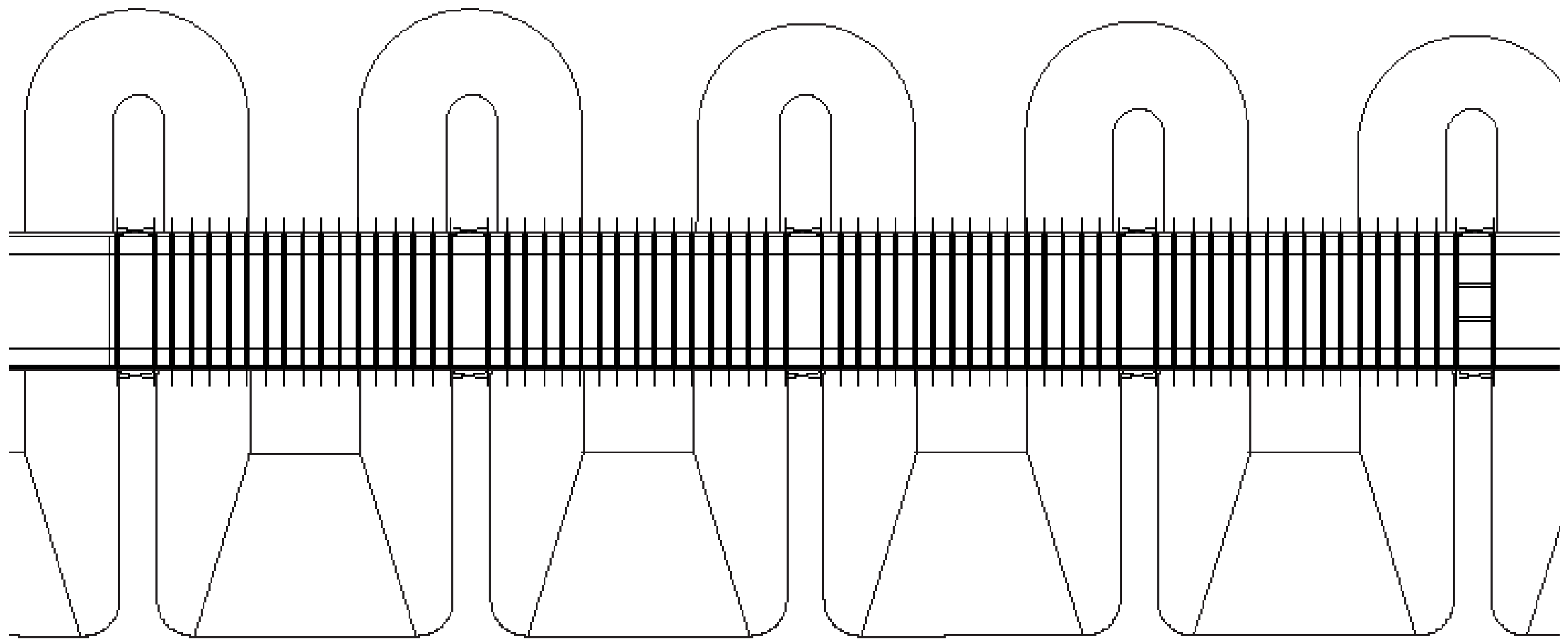


Floorplan

Original Ground
Condition

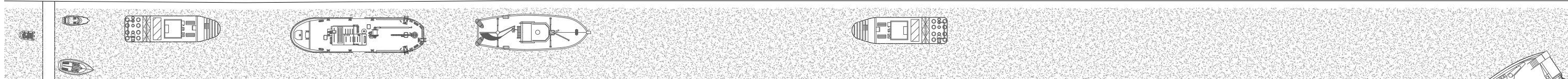
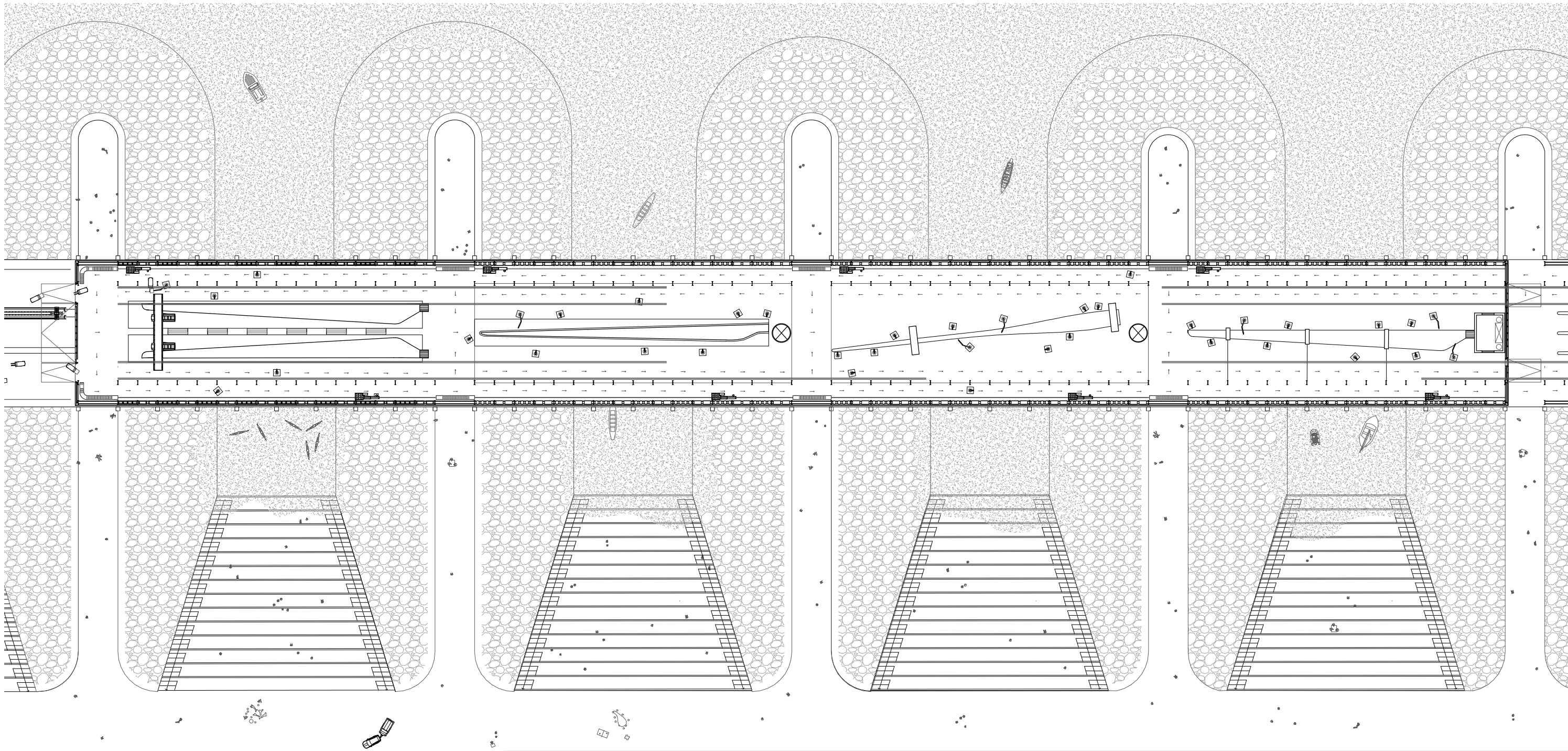
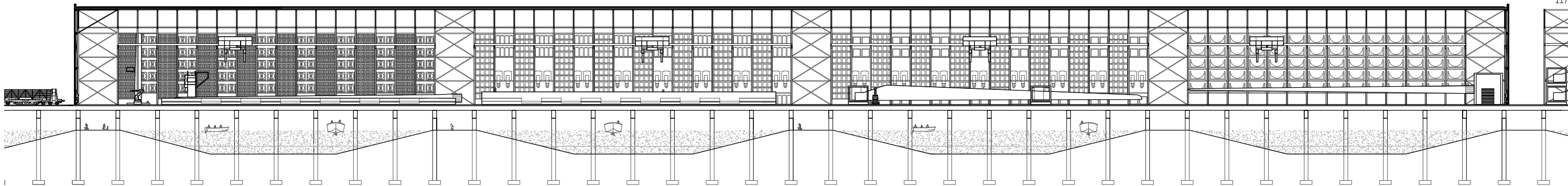


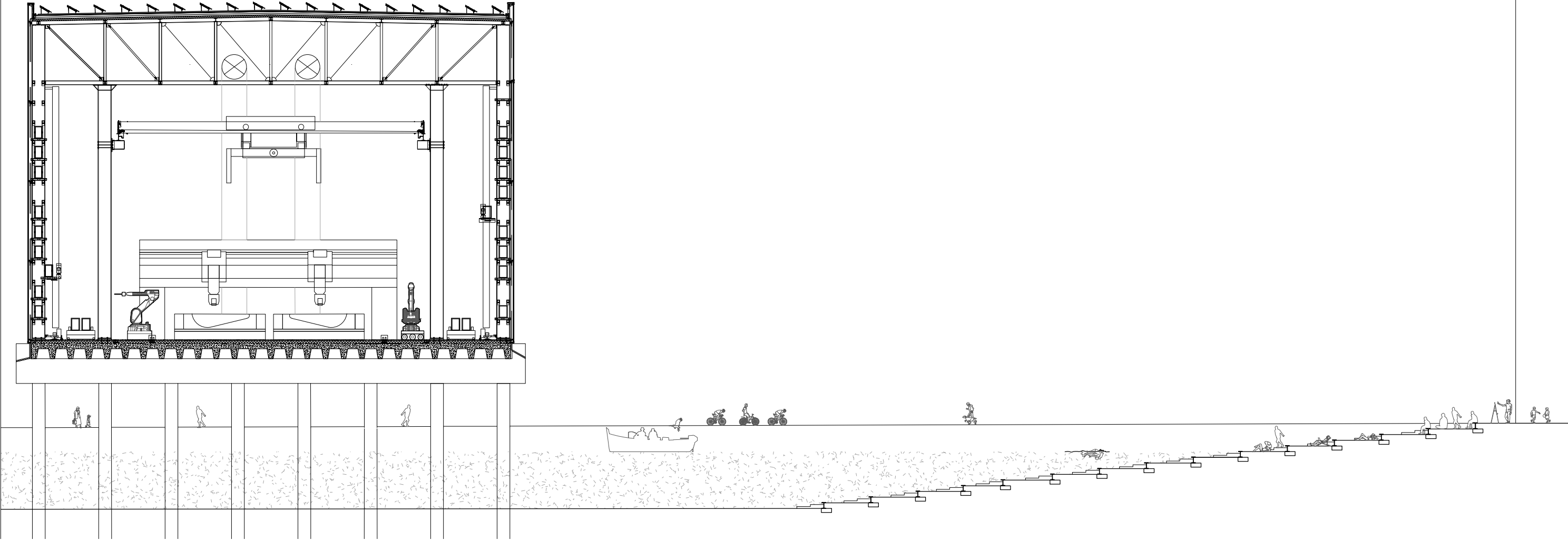
Section Elevation



Floorplan

Carved Ground Condition





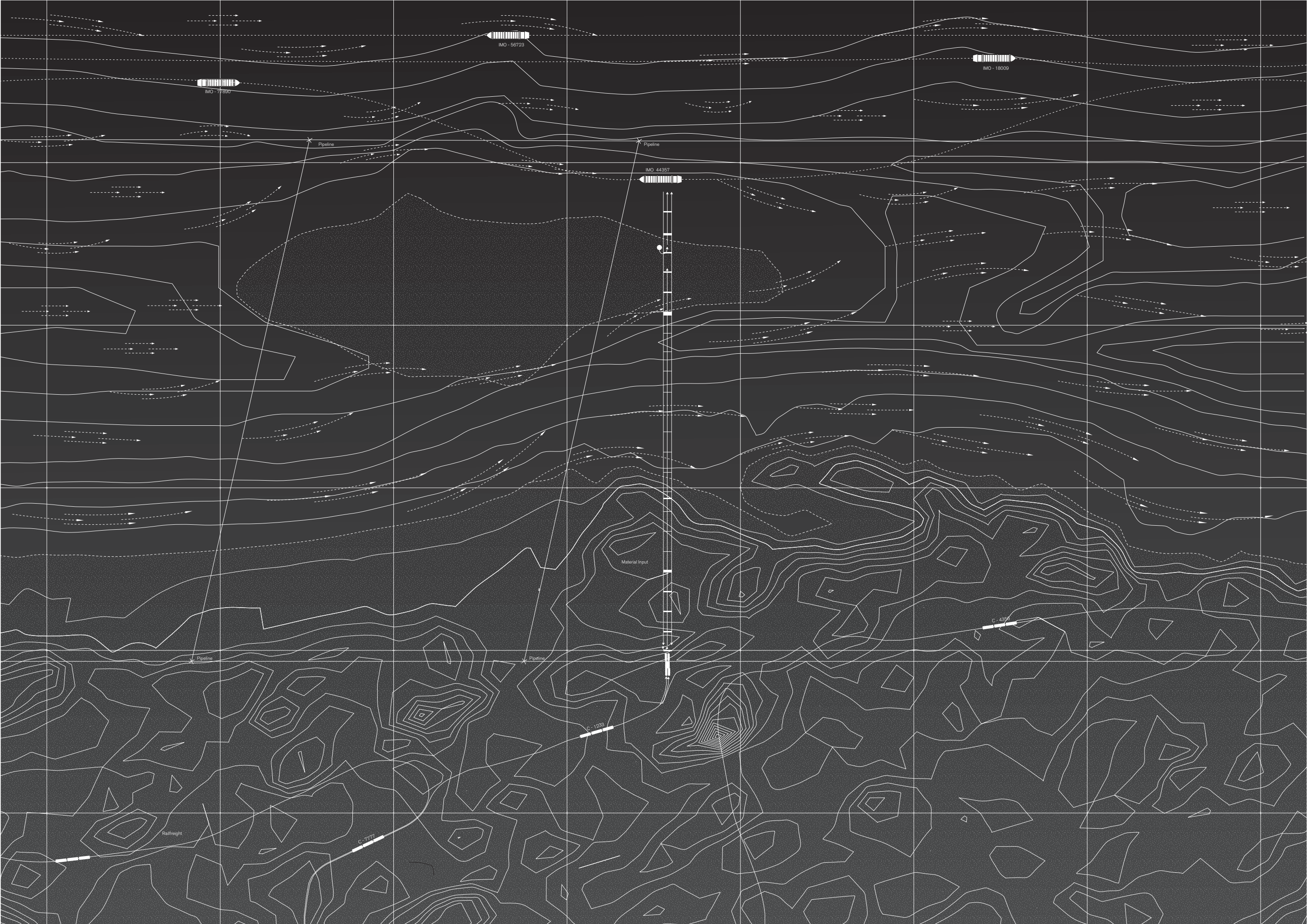
Short Cross Section
1:200

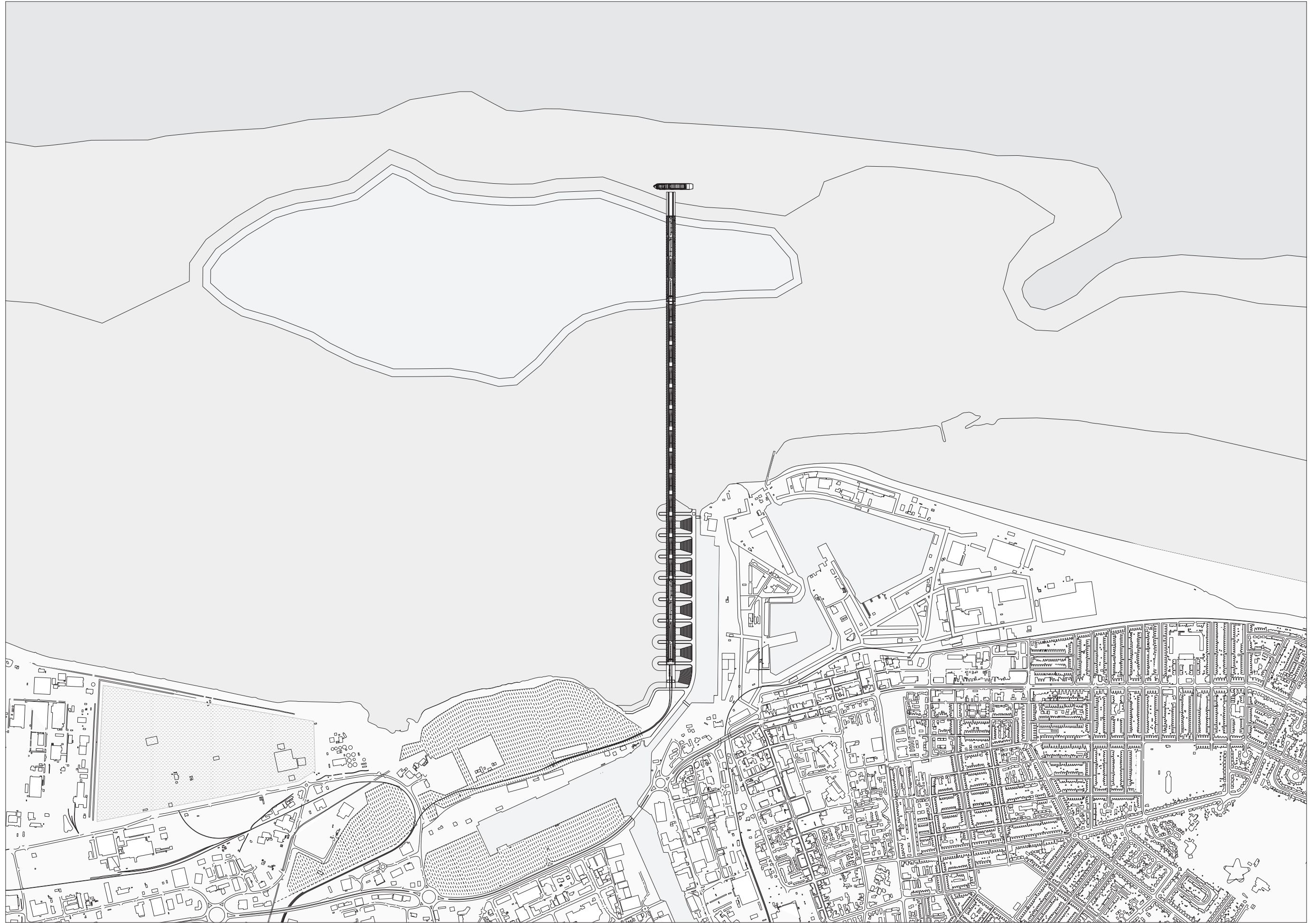
The Automated Pier

The Spaces are then arranged in linear order, and what becomes clear is that the manufacturing process of the blade is linear like an assembly line. In combination with the natural flow of import and export, and the need to reduce dredging and seek deeper water, the linear process is combined with the linear flow into a pier, that extends to the deeper end of the river (15m). The part over the water is opened, to expose the skeleton of the building, an area of storage and possible expansion.

[illegible]

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1



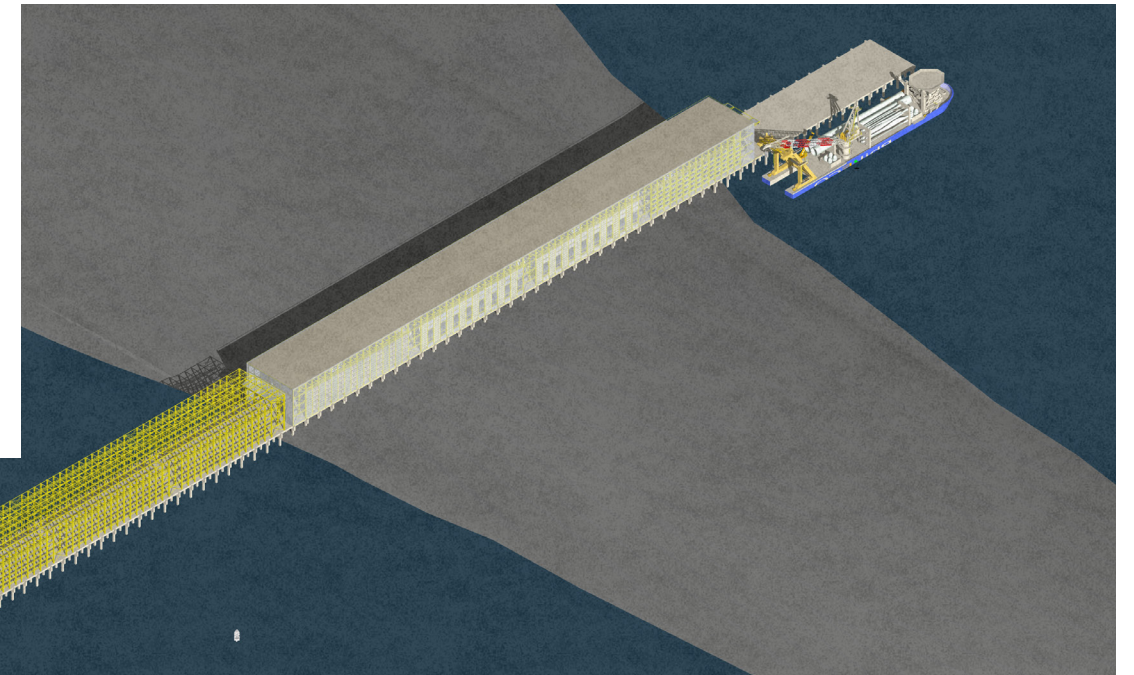
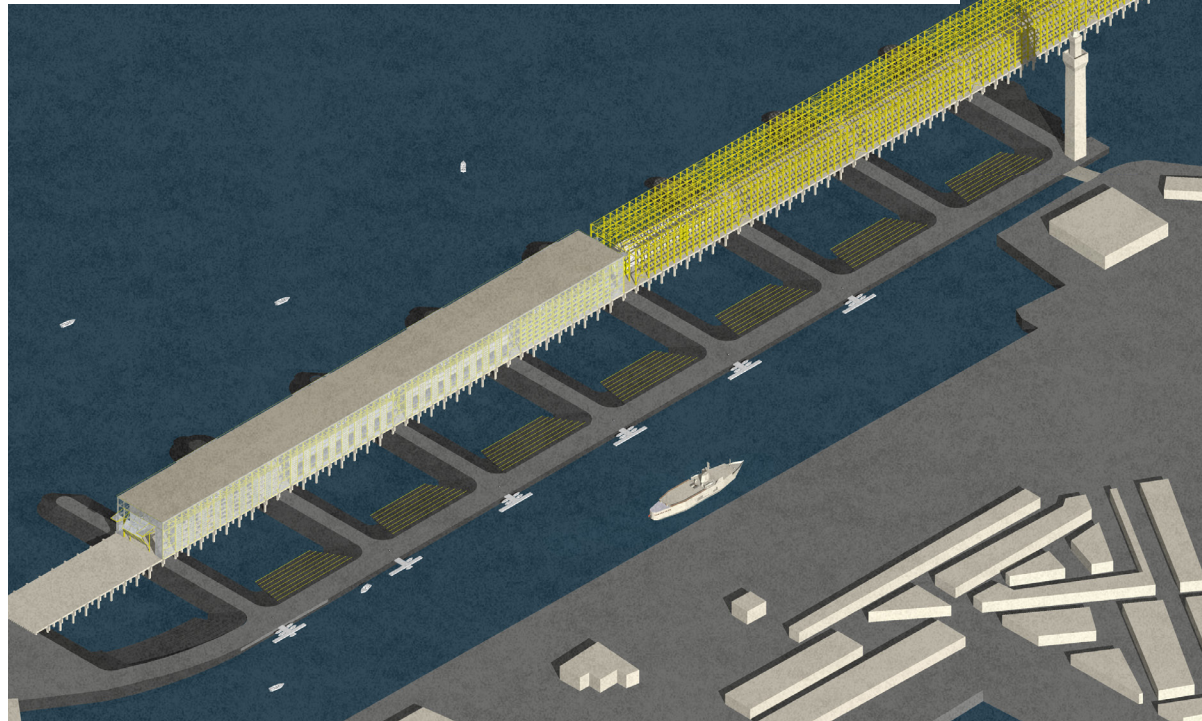


Grimsby Port Urban Intervention
Scale 1:5000

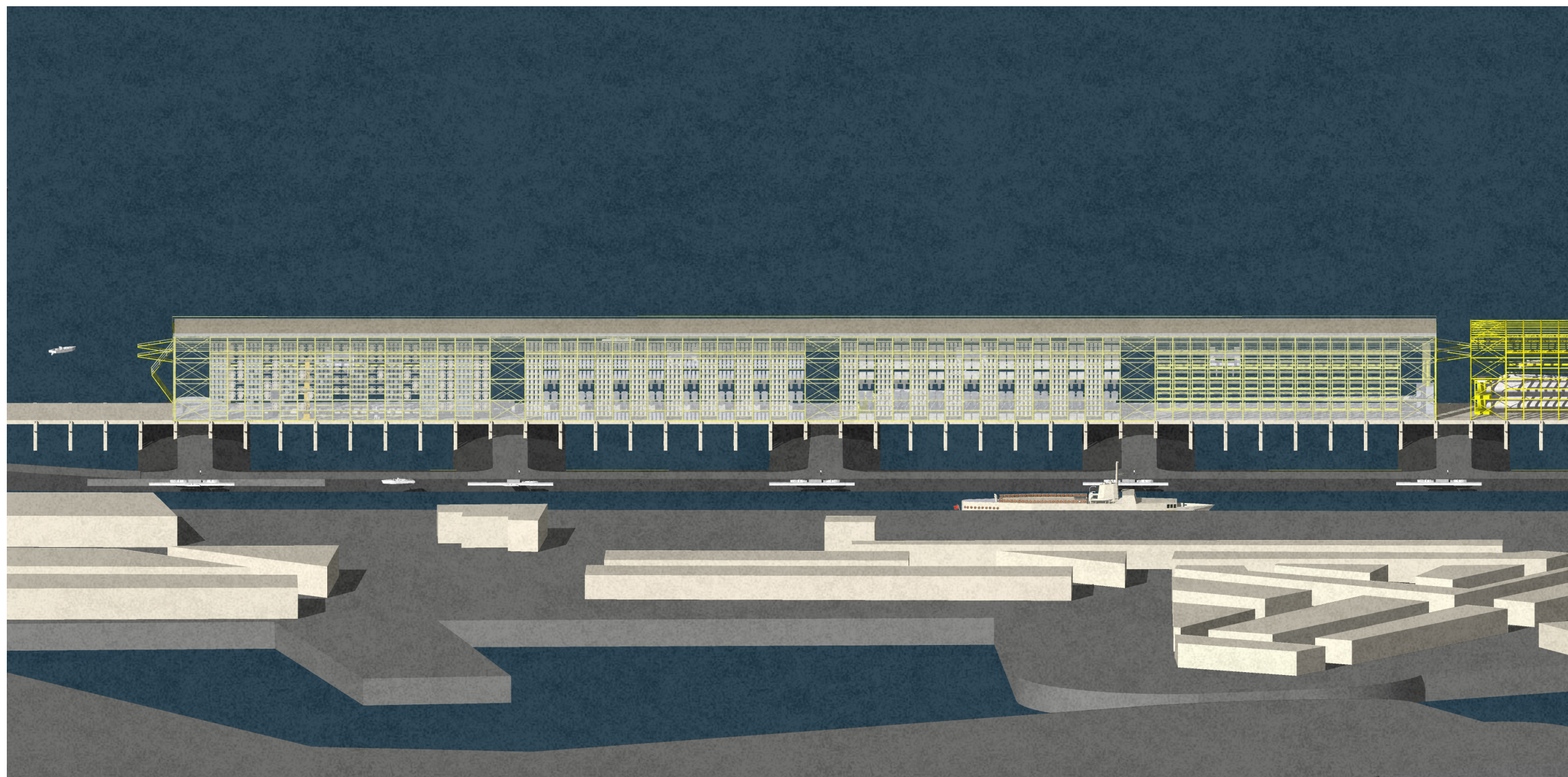
Deep River

Over Water

Shore



The Pier: From Shore to
Sea



The New Coastline

The Spectacle

The Final Output is a translucent polycarbonate facade with Glass fiber profiles. The creation of a "Wunderkammer" with the outside reflecting the processes inside, a vague manifestation of the process on the facade of the building.

The placement of the object and the formation of the new coastline allows for an experience of both automated and natural processes. Both cycles , both automated and natural create a spectacle. A space for distraction, contemplation, and mostly for reflection, on the processes that are in transtion. The unseen becomes seen, in this one object of containment. An attempt at making the automated process graspable for humans.



The Spectacle

The building is experience through different times of day and seasons. From the shore, one can experience both tidal and process changes.

