BRÅTA

PAVILJONGEN

...ett varv till...

JIG

CHALMERS UNIVERSITY OF TECHNOLOGY

MISTRA URBAN FUTURES

Titel:
Bråtapaviljongen...ett varv till...

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Producerad:
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BRÅTAPAVILJONGEN RAPPORT

Denna rapport har gjorts av JIG Design Ekonomisk Förening och Chalmers Tekniska Högskola för Härryda kommun. Det är ett förberedande dokument för utformningen av en paviljong på Bråta återvinningscentral.

Härryda Kommun har inlett projektet Bråtapaviljongen med JIG i samarbete med pågående forskning vid institutionen för arkitektur vid Chalmers Tekniska Högskola och Mistra Urban Futures. Forskningen handlar om "Regenerativt Platsskapande".

Denna rapport syftar till att definiera funktioner och ungefärlig yta av paviljongen samt designstrategier för att uppfylla den övergripande visionen. Detta dokument kommer att bli bas för den andra fasen av projektet: designutveckling av paviljongen. Som en förväntad utveckling kommer detta designprogram att justeras under designprocessen.

Rapporten består av två delar: I den första presenteras designprogram för Bråtapaviljongen; i den andra är en sammanfattning och analys av bedömningar av Bråtas nuvarande situtión och designförslag som gjordes av masterstudenter på skolan för arkitektur vid Chalmers tekniska högskola, under en kurs med titeln "Sustainable Building" våren 2014.

Denna rapport är skriven på två språk: Programmet är på svenska, men sammanfattningen av studenternas arbete är på engelska eftersom deras arbete gjordes på engelska och det bedömdes för tidskrävande att översätta.

THE BRÅTA PAVILION REPORT

This report has been made by JIG Design Ekonomisk Förening and Chalmers University of Technology for the municipality of Härryda. It is a preparative document for the design of a pavilion for the recycling centre of Bråta.

Bråtapaviljongen is a project initiated by the municipality of Härryda with JIG in collaboration with on-going research at the department of Architecture of Chalmers University of Technology and Mistra Urban Futures.

This report aims to define functions and the approximate surface of the pavilion, as well as design strategies for the building to fulfil the overall vision. This document will become the base for the second phase of the project: the design development of the pavilion. The program is a starting point, establishing mutual understanding and is often adjusted according to discoveries and discussions made during the design process.

This report consists of two sections: The first includes the design programme of *Bråtapaviljongen*; the second includes a summary and an analysis of assessments of Bråta's current situation and design proposals conducted by master's students at the school of Architecture at Chalmers University of Technology, during a course entitled "Sustainable Building" in Spring 2014.

This report is written in two languages: The programme is in Swedish while the summary of the student's work is left in English in order to reduce the time needed to compile and produce this report.

SAMARBETEN

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INNEHÅLL

Bråtapaviljongen
PROGRAM

Programmet för Bråtapaviljongen har tagits fram utifrån Härryda kommuns behov och önskemål om att göra Bråta Återvinningscentral till en plats för ökat återbruk. En utvärdering av studentprojekten i studion "Sustainable Building" på Chalmers Arkitektur vårterminen 2014 och en genomgång av grunderna för Regenerativ Design har bidragit till diskussionen kring programet. Diskussioner har förts mellan JIG, Chalmers och Härryda kommun för att nå detta första utkast till ett program för paviljongen.

Programmet presenterar projektets bakgrunden, mål och visioner, samt en sumering av studenternas visioner från "Sustainable Building" kursen och en sumering av forskningskontexten som studenternas arbete och detta projekt ingår i. Det innehåller även generella krav för specifika rumsfunktionsprogram samt en strategi för materialinsamling för projektet.

PROJEKTETS BAKGRUND

Trots namnet *Återvinningscentral*, förbränns det mesta av avfallet som samlas in vid Bråta och blir till fjärrvärme eller el. Gips, metallskrot, elektronik och några fler fragment återvinns och stenar, tegel, jord etc. används för att täcka deponier. Avfallshanteringens fokus är dock på väg att förändras från att på ett effektivt sätt bli av med avfall till att minimera uppkomsten av avfallet. Förändrade attityder och beteenden blir allt viktigare. För att nå de som skapar mycket avfall, ofta dem som tycker om att renovera, är återvinningscentraler naturliga mötesplatser.

Runt Göteborg finns flera återvinningscentraler, som mer eller mindre liknar Bråta. En av dem är särskilt inriktad på återanvändning: Alelyckan norr om Göteborg. Här kan besökare lätt lämna grovavfall och även besöka flera second-hand butiker eller ta en kaffe på ett café med återanvända interiörer. Men varje plats måste söka en lösning som fungerar i den lokala kontexten och Bråta vill undersöka vad som kan göras i Härryda kommun och den plats de befinner sig på.

Sedan några år finns det tre containrar för återanvändning på Bråta. Dessa ägs av ideella organisationer för att samla in kläder, användbara byggmaterial och saker i gott skick. Besökare är fria att lämna saker och ting här i stället för någon annan behållare, där det skulle förbrännas eller återvinnas. Containrarna för återanvändning är inte väl använda jämfört med resten av återvinningscentralen. De är inte i god fysisk form och dåligt placerad i ett hörn, långt ifrån det viktigaste sorteringsområdet.

SYFTE

Projektets syfte är trefaldig: (1) att utforska begreppet, rollen och utformningen av återvinningscentralen som offentlig miljö i samhället, (2) hur detta kan bidra till en reducering av användbart material som går till förbränning, (3) att undersöka, testa och sprida kunskap om design och byggmetoder där återanvändning och kretslopp är i fokus.

MÅL

Många av besökarna på Bråta är där för att de renoverar eller bygger villor. De är husägare eller entreprenörer. Dessa är potentiella köpare av återanvänt byggmaterial, det är bygg entusiasterna som kan tänkas använda udda material till en ny byggnad. Projektet på Bråta handlar om att bygga en paviljong för att samla användbara saker och byggmaterial. Paviljongen ska vara tillverkad av återanvänt byggmaterial. En väl utformad paviljong kommer att öka mängden material som samlas in och även inspirera besökarna att använda gammalt / överblivet material. Detta kommer att öka efterfrågan på återanvändbara byggmaterial och bredda marknaden. Det är en bättre användning än att bränna materialet för energi eller lägga det på en deponi.

VISION

Bråta kan bli mer än en plats där invånarna bekvämt blir av med det de inte vill ha. Med en ny design och organisation kan den användas för att inspirera och sprida nya idéer. Det kan bli en mötesplats där man omvärderar och provar olika sätt att få kretsloppstänkande in i sin vardag och på så sätt påverka en bättre hantering av avfall och uppkomsten av den. Bråtas vision är att skapa en plats för uppvisning och utforskande av olika metoder för att förbättra resurshanteringen i samhället.

FORSKNINGSINRIKTNING

Regenerativ design fokuserar på glokala villkor för platsen samt ett fruktbart förhållande mellan ekosystemens och samhällets principer och behov. För att bidra till diskussionen om livskraften i regenerativa designstrategier, fokuserar forskningen på sambandet mellan regenerativa materialcykler och platsskapande. Närmare bestämt behandlar den utformningen av utrymmen som ser avfall som resurs, och hur detta har påverkats av, eller påverkar, den glokala känslan av plats och samhälle. Det är i synnerhet en reflektion över hur designprocessen påverkas av, och påverkar, särdragen i rumsliga konfigurationer, former och strategier som stödjer en kultur av återanvändning och regenerativt platsskapande.

SUMMERING AV STUDENTERNAS VISIONER

Studentprojekten i studion "Sustainable Building" innehåller visioner för hur återvinningscentraler kan omtolkas, bli en starkare offentlig plats i stadslandskapet, samt hur den kan ha en större påverkan på samhällets resurshantering i stort. Dessa har omtolkats till gemensama teman och samlats under olika kategorier. Studenternas visioner är utvecklade utifrån projektets problembeskrivning de fått från Härryda, kursuppgiftens krav och teorin av Regenerativ Design som presenterats till de i Sustainable Building kursen. (Se kursuppgiftens beskrivning sida 93)

PARADIGMSKIFTE ANGÅENDE AVFALL OCH RESURSER

- ompröva avfallsstegen
- 'avfall = mat' / 'cradle-to-cradle' / biologiska och tekniska cykler
- förnuftig användning av lokala resurser som vind, sol och vatten

REGENERATIVE DESIGN OCH ARKITEKTURENS ROLL I PARADIGMSKIFTET

- kommunicera och utbilda
- inspirera och stärka
- underlätta och förbinda

ASPEKTEN OCH INFLYTANDE AV TID

- historia, nutid och framtid
- aktivitetsflöde och variationer (dag, årstid, era)
- strukturell/materiell beständighet kontra flexibilitet

RELATION TILL FYSISK KONTEXT (LANDSKAP OCH BYGGD MILJÖ)

- fysiska samband och gränser
- konceptuella och upplevda samband och gränser
- funktionella samband och gränser

SKIFTE FRÅN PERIFERI TILL NAV

- ompositionering av begreppet och funktionen av återvinningscentraler i samhället
- ett nav av aktiviteter
- samhällets hjärta vad gäller materialcykler
- ett centrum för information och utbildning
- uppvisning och utforskning av regenerativa (hållbara) strategier och teknik

RELATERA TILL "GLOKAL" KONTEXT

- global och lokal påverkan på resurstillgång och användning
- 'tänk globalt, agera lokalt'
- skapa inspiration för andra samhällen
- virtuell (internet) och fysisk relevans i samhället

INTEGRATION OCH MÅNGFALD

- användarnas behov och roller
- demografi (ålder, inkomst, kön, transportbehov, etc.)
- människans livsmiljö kontra djurens
- mångfald av aktiviteter (kommersiella, sociala, kreativa, pedagogiska, etc.)

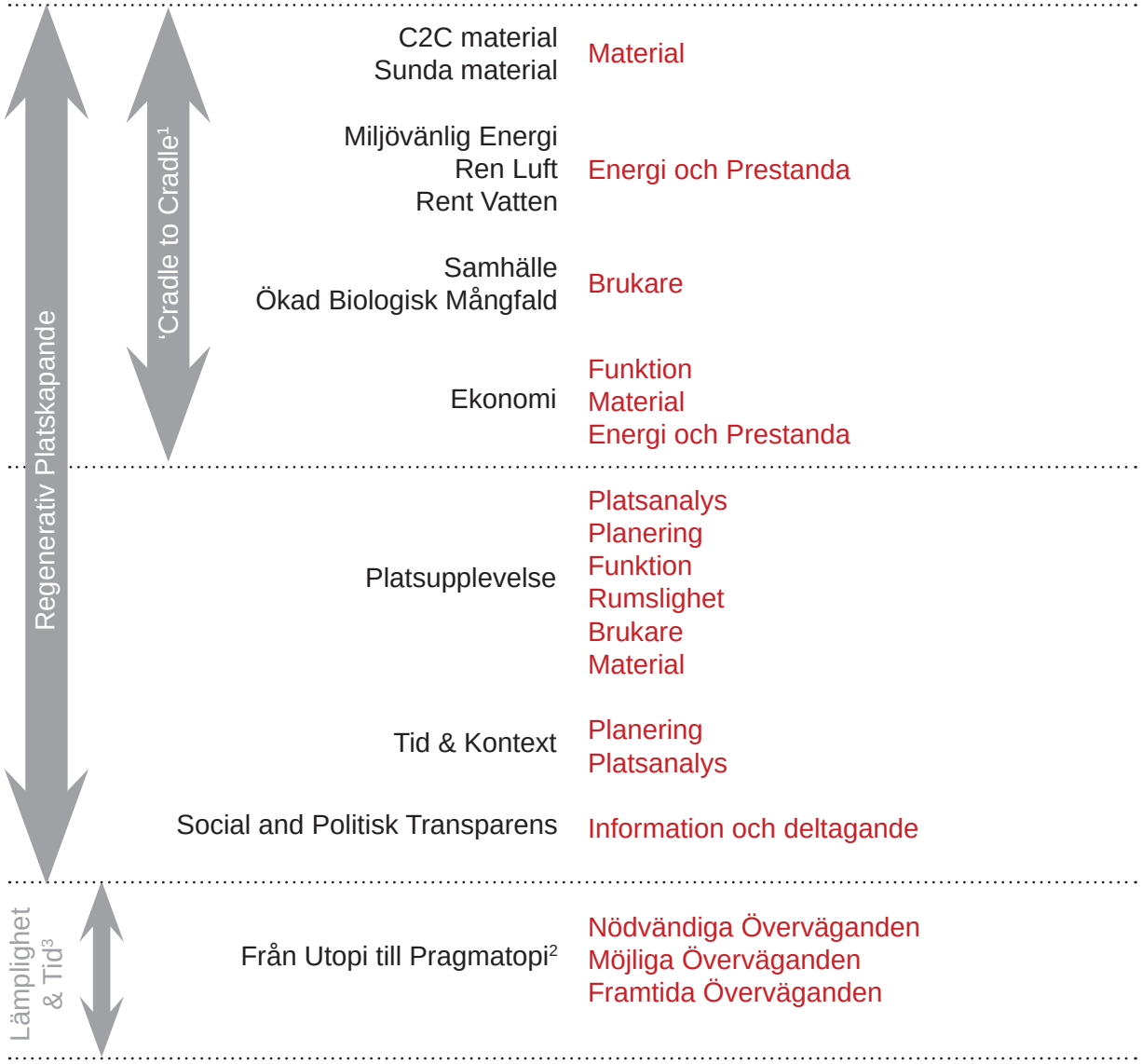
TEORI- & FORSKNINGSKATEGORIER

Begreppen nedan är de tre viktigaste kategorierna i forskningsstudien som löper parallellt med designstudion och designprojektet. Dessa begrepp introducerades för studenterna och ombads att betrakta dem i utvecklingen av sina förslag.

KATEGORIER I PROGRAMMET

Kategorierna nedan utvecklades i arbetet med att utvinna användbara element och strategier från designstudion. Dessa användes sedan för utveckling av programmet för designprojektet och är använda i följande designkrav för paviljongen.

Diagrammet nedan visar hur de förhåller sig till forskningsbegreppen.



[1] Cradle to Cradle (C2C) design principles for the built environment developed by GXN research group and endorsed by Michael Braungart and William McDonough (the originators of C2C design philosophy). These contribute to but do not encompass the full complexity of 'regenerative placemaking'.

[2] The students were encouraged to develop their concepts with a utopian outlook of limitless possibilities of the entire site; the *Bråtapaviljong* design group is charged with finding a pragmatic approach to divining the possibilities within a single building intervention on the site and its role in future developments.

[3] These three categories were chosen to define how relevant a design strategy from the Sustainable Building Studio were to the development of a programme for *Bråtapaviljongen.*

BRÅTAPAVILJONGEN

För att nå Bråtas mål om mindre brännbart avfall, erfordras en plats för insamling av användbart material för återanvändning. Denna plats kallas *Bråtapaviljongen*. Följande sidor beskriver tänkta designkrav för syfte, funktion och platsupplevelser för paviljongen och dess utrymmen. Kraven är i verkligheten riktlinjer som kan justeras allt eftersom nya upptäckter görs i designfasen.

BYGGNADEN SOM HELHET

Den nya paviljongen ska byggas av återanvänt material från Bråta samt både främja och underlätta lämning och användning av återanvända ting. Byggnaden i sig ska informera, inspirera och göra det möjligt för gemene man att bygga med återanvänt material. Stor vikt bör därför läggas vid Bråtapaviljongens estetiska och arkitektoniska utformning och idéer kring att projektet kan få besökarna att tänka i nya banor. Den skall vara en plats som är rotad i de lokala förutsättningar och med åtanke för de globala utmaningarna där innovation, samhörighet för en bättre framtid kan diskuteras, utvecklas och undersökas. Med dessa egenskaper bör byggnaden skapa en minnesvärd platsupplevelse där behörighet och utveckling samspelar och inspirerar.

Bråtapaviljongens placering bör få besökarna att intuitivt stanna för att sortera och lämna användbart material innan de når rampen med övriga containrar. Viss vägledning från personal och tydlig skyltning och information krävs. Bråtapaviljongen kan, om möjligt, ha andra öppettider än återvinningscentralen.

Information kring paviljongens byggprocess, materialval och detaljer kan visas digitalt eller med informationstavlor på plats.

Framtida utveckling av Bråta som helhet och expansionsmöjligheter för byggnaden ska tas i beaktande. Bråta kan i framtiden ingå i större EU-projekt där Butik Händig och andra organisationer samarbetar med Bråta. För tillfället planeras inget att säljas på plats. framtiden kan en second-hand affär öppnas på Bråta som separat byggnad eller som en förlängning av paviljongen.

EXTERIÖR

Exteriören kring Bråtapaviljongen ska bidra till att skapa en helhet på platsen. Grönska kan med fördel planeras runt paviljongen för att förändra Bråta till en levande plats och integrera ekosystem tjänster till både människor, byggnad, djur och miljö. Rumsliga kvalitéer är viktiga att skapa kring byggnaden, särskilt en inbjudande ENTRÉ och ett trivsamt UTERUM.

INLÄMNINGS- / SORTERINGSLOKAL

Bråtapaviljongen bör innehålla plats för insamling av byggmaterial, kläder, samt övriga saker i gott skick. Tre-fyra organisationer kommer att samla in diverse material i paviljongen. Detta innebär att lagringssystemet måste vara flexibelt och enkelt att använda samt att besökarna kan lämna avfallet på ett prydligt sätt. Organisationerna kommer att tömma sina behållare/hyllor åtminstone en gång i veckan. Det tar vad de vill ha och slänger resten till återvinning och förbränning. Ett alternativ som bör undersökas är att organisationerna skall istället kunna lämna det de inte kan sälja till en s.k. swopshop, en plats för byten av saker som är integrerad i paviljongen. Det användbara, insamlade byggmaterialet i Bråtapaviljongen kommer att säljas till Alelyckan i Göteborg. Detta material kommer att hämtas med lastbilar.

MULTI-FUNKTIONSLOKAL

Utöver insamlingsplatsen bör Bråtapaviljongen även innehålla en plats för mindre föreläsningar, workshops, utställningar och ett enklare café. Föreläsningarna, workshopen och utställningarna kan kretsa kring hur man kan minimera avfall genom att återanvända mer. Caféet kan bestå av ett antal bord och stolar, samt en kaffemaskin och kan resultera i spontana möten och samtal kring återanvänt material. På detta sätt bidrar paviljongen till att Bråta utvecklas som social mötesplats och inspirerar till ett liv med mindre avfall.

TEKNIKRUM

Beroende på omfattning och val av teknik krävs en plats där tekniken samlas. Tekniken ska vara synlig med syfte att sprida kunskap. Om teknikrum inte krävs i dagsläget bör yta/plats för framtida teknikrum planeras.

BYGGNADEN SOM HELHET (ca 105 m2 + utemiljöer + kommunikation)

FUNKTION	Syfte	*Stödja, undersöka, inspirera och informera om aktiviteter och strategier som kan bidra till att minska mängden avfall som går till förbränning.*
	Aktiviteter	*Se enskilda rumsfunktionsprogram*
	Innehåll	*Se enskilda rumsfunktionsprogram*
	Förvaringsbehov	*Avlastningsplats* *Fler parkeringsplatser och cykel parkering kan behövas vid aktiviteter.* *Se även enskilda rumsfunktionsprogram*
RUMSLIGHET	Upplevelse	*Bråta och Bråtapaviljongen ska ha en tydlig visuell identitet och är något av det första man märker när man är på Bråta. Man blir nyfiken och dras in av den välkomnande känslan från byggnadens utformning.*
	Sol och skugga	*Krav på rikligt med dagsljus året om.* *Skugga bör användas för att undvika för varma temperaturer på sommaren.* *Solinstrålning bör användas som värmetillförsel på vintern.*
	Belysning	*Belysning skall vara effektivt placerad för att skapa rumslighet, säkerhet och en effektfull upplevelse av platsen.* *Se även enskilda rumsfunktionsprogram*
	Ljudkrav	*Se enskilda rumsfunktionsprogram*
	Storlek	*ca 105 m2 + utemiljöer + kommunikation (se enskilda rumfunktionsprogram)*
	Rumshöjd	*Se enskilda rumsfunktionsprogram*
PLANERING	Läges- och sambandskrav	*Lokalen måste vara väl synlig på Återvinningscentralen.* *Platsen/lokalen måste passeras innan rampen med containrar nås.* *Krav på säkra kommunikationer från parkering till lokalen.* *Konstverk och välkomstskylt kan ställas ut på återvinningscentralen, vid Bråtas entré, eller vid rondellen för att väcka intresse och bjuda in.*
	Framtida planering	*Framtida utveckling av Bråta som helhet bör beaktas i placeringen av byggnaden.* *Paviljongen måste även vara flexibel internt och ha utrymme för expansion externt för ändrade rumsfunktioner och behov.*
BRUKARE	Människor	*Brukarna är de som redan är på Bråta idag, de som slänger men inte återanvänder.* *Familjer till de som redan är på Bråta idag.* *Skolklasser och andra besökare som vill lära sig om resurshantering, kreativt återbruk och/eller hållbarhetstrategier (t.ex. regenerativ design)* *Anställda på Bråta.* *Inbjudna föreläsare, konstnärer eller hantverkare*
	Djur och växter	*Exteriöra utrymmen kan användas för att skapa små viloplatser och habitat för insekter och fåglar genom att använda växtlighet där det är lämpligt.*

RUMSFUNKTIONER

INFORMATION & DELTAGANDE	Information	*Information om byggnaden, materialen, konstruktion och processen ska finnas i och omkring Bråtapaviljongen, antingen digitalt eller visuellt. Krav finns därför på dokumentation av valda material och process.*
	Deltagande	*Deltagande och organiserande av aktivitieter* *Social mötesplats* *Deltagarna känner att de bidrar till en bättre resurshantering i samhället*
MATERIAL	Kvalitetskrav	*Materialen skall bidra till en estetiskt tilltalande, inspirerande paviljong.* *Avfall i konstruktionsfasen skall minimeras.* *Val av material prioriteras enligt listan nedan:* *1: Återanvänt material från Bråta.* *2: Återanvänt material från annan Återvinningscentral.* *3: Lokalt producerat material baserat på återvunna råvaror.* *4: Icke-lokalt producerat material baserat på återvunna råvaror.* *5: Lokalt producerat material baserat på nya råvaror som har god miljöstandard och helst hålla för regenerativa designkrav.* *6: Icke-lokalt producerat material baserat på nya råvaror som har god miljöstandard och helst hålla för regenerativa designkrav.*
ENERGI & PRESTANDA	**VVS**	*(värme, ventilation och sanitet)*
	Sanitet	*Se enskilda rumsfunktionsprogram*
	Varmvatten	*Se enskilda rumsfunktionsprogram*
	Kallvatten	*Se enskilda rumsfunktionsprogram*
	Avlopp	*Minimera dagvatten avrinning genom exempelvis grönt tak och genomsläppliga markytor.* *Se även enskilda rumsfunktionsprogram*
	Temperaturkrav	*Se enskilda rumsfunktionsprogram*
	Värme	*Minimera behov av tillförd värme.* *Se även enskilda rumsfunktionsprogram*
	Kyla	*Tillförd kyla skall ej behövas.* *Se även enskilda rumsfunktionsprogram*
	Ventilationskrav	*Naturlig ventilation bör eftersträvas.*
	EL	
	El-Förbrukning	*Minimera tillförd energibehov i byggnaden.* *Ljuskällor skall ha låg energiföbrukning.* *Belysning skall vara effektivt placerad för att minska elanvändning.*
	Uttag	*Se enskilda rumsfunktionsprogram*
	Telefon	/
	Data	*Krav på WIFI*

ENTRÉ

FUNKTION	Syfte	*Ett utrymme som välkomnar besökarna in i paviljongen samt underlätta avlastning, logistik och rörelse kring och in i byggnaden.*
	Aktiviteter	*Avlastning av material från privata fordon* *Ankomst till paviljongen* *Spontana sociala möten* *Uppvisning av exempel på hur man återbrukar material i byggnader.*
	Innehåll	*Dörrarna ska vara minst 120 cm utan trösklar.*
	Förvaringsbehov	/
RUMSLIGHET	Upplevelse	*Bråtapaviljongens entré ska vara välkomnande och lockande.* *Bråtapaviljongens entré ska vara väl synlig på området.* *Grönska kan med fördel planeras för att skapa en meningsfull och behaglig exteriör.*
	Sol och skugga	*Krav på dagsljus*
	Belysning	*Belysning skall vara effektivt placerad för att skapa rumslighet, säkerhet och en effektfull upplevelse av platsen.* *Utomhusbelysning för kvälls- eller vinteraktiviteter.*
	Ljudkrav	/
	Storlek	/
	Rumshöjd	*Välkomnande rumshöjd, minst 230 cm*
PLANERING	Läges- och sambandskrav	*Entrén ska, om möjligt, innefatta både multi-funktionslokalen och inlämning/sortering.*
	Framtida planering	*Framtida utveckling av använding och storleksbehov ska tas i beaktande.*
BRUKARE	Människor	*Användare och besökare till Bråtapaviljongen (se generella krav), som vill mer än bara lämna saker till återanvändning.* *Anställda på Bråta.* *Inbjudna föreläsare, konstnärer eller hantverkare*
	Djur och växter	*Exteriöra utrymmen kan använads för att skapa små viloplatser och habitat för insekter och fåglar genom att använda växtlighet där det är lämpligt.*
INFORMATION & DELTAGANDE	Information	*Information om vart man skall gå för olika funktioner*
	Deltagande	*Infomell social mötesplats*

MATERIAL *(Se även generella krav.)*	Kvalitetskrav	*Materialen skall vara slittåliga och tåla väder.* *Vattengenomtränglig markbeläggning där möjligt.* *Materialet i entrén ska inspirera och bidra till en välkomnande atmosfär*
ENERGI & PRESTANDA *(Se även generella krav.)*	**VVS**	*(värme, ventilation och sanitet)*
	Sanitet	/
	Varmvatten	/
	Kallvatten	/
	Avlopp	*Vattenavrinning till andra områden bör försöka undvikas genom att ha en vattengenomtränglig markbeläggning och växtlighet.*
	Temperaturkrav	*Entrén till inlämnings- och sorteringshallen har inga krav på uppvärmning,* *Entrén till multi-funktionslokalen kan dock användas för att minska värmeförluster i lokalen, men den behöver inte vara uppvärmd som luftsluss.* *Om entrén innefattar plats för att hänga av sig jackor så kan en lätt uppvärmning vara fördelaktig.*
	Värme	/
	Kyla	/
	Ventilationskrav	/
	EL	
	El-Förbrukning	*Ljuskällor skall ha låg energiföbrukning.* *Belysning skall vara effektivt placerad för att minska elanvändning.*
	Uttag	*El för städ, reparationer etc. krävs.*
	Telefon	/
	Data	/

INLÄMNING /SORTERING

(ca 70 m2 + kommunikationsutrymme)

FUNKTION	Syfte	*Ett utrymme för att lämna och sortera använt byggmaterial, kläder, möbler och saker i gott skick för återanvändning.*
	Aktiviteter	*Inlämning och sortering av saker för återbruk.* *Avhämtning av donerade ting.* *Uppvisning av exempel på hur man återbrukar material i byggnader.* *Möjlig plats för 'swop shop'*
	Innehåll	*Inlämnat byggmaterial, kläder, möbler och mindre hushållsartiklar.* *Krav på bra skyltning och info för att guida besökarna.*
	Förvaringsbehov	*Krav på olika sektioner till organisationerna, dock inte krav på olika rum.* *Förvaringsutrymmen bör vara låsbara, dock ej där byggmaterialet finns.* *Hyllor och korgar/lådor för små objekt, golvyta för stora* *Möjlighet till ombyggnad och utbyggnad av sorteringsutrymmen*
RUMSLIGHET	Upplevelse	*En tydligt uppdelad miljö där det är tydligt hur och vart man skall lämna saker för återanvändning och vart dessa saker kan hamna.* *Rummet bör kännas luftigt och ljust, en behaglig miljö där en viss balans mellan ordning och oordning får råda utan att störa helheten.* *Människor känner att de vill titta runt lite efter att de lämnat sina saker, båda på det som har lämnats in av andra, samt på återanvändningen i byggnaden i sig.*
	Sol och skugga	*Krav på rikligt med dagsljus året om.*
	Belysning	*God allmän belysning för sortering och inlämning av material*
	Ljudkrav	/
	Storlek	*ca 70 m2 av förvaringsutrymme + kommunikation och logistik* *(Storleken för logistik och kommunikation beror på om bilar och truckar skall kunna köra in i lokalen.)*
	Rumshöjd	*Krav på hög rumshöjd för god logistik.*
PLANERING	Läges- och sambandskrav	*Krav på god logistik.* *En på- och avlastningsområde för både lastbilar och personbilar. (Gärna separata.)* *Lokalen ska ligga i nära samband med multi-funktionslokalen.* *Nära entrén.*
	Framtida planering	*En eventuell ökning av återvunnet material kan kräva utbyggnad/tillbyggnad av lokalen. Denna framtida expansion ska beaktas i designen.*
BRUKARE	Människor	*Användare och besökare till Bråtapaviljongen (se generella krav), som vill mer än bara lämna saker till återanvändning.* *Anställda på Bråta.* *Tre-fyra olika ideella organisationer ska dela paviljongen.*
	Djur och växter	/
INFORMATION & DELTAGANDE	Information	*Information om vart inlämnat material sorteras, samt vart det kan användas efteråt.* *Information om byggnadsmaterial bör vara tillgängligt fysiskt eller digitalt.*
	Deltagande	*De som lämnar in material skall känna att de bidrar till olika verksamheter och en bättre resursförbrukning i samhället.*

MATERIAL *(Se även generella krav.)*	Kvalitetskrav	*Materialet i lokalen ska vara slittåligt och lättstädat.* *Krav på slittåligt golv som tål stor vikt (t.ex. truck-körning)*
ENERGI & PRESTANDA *(Se även generella krav.)*	**VVS**	*(värme, ventilation och sanitet)*
	Sanitet	*Tvättställ för att tvätta händer bör finnas. Kan med fördel kombineras med tvättställ för det multi-funktionella rummet*
	Varmvatten	/
	Kallvatten	*Krav på kallvatten.*
	Avlopp	*Från tvättställ.* *Golv brunn är fördelaktig för storskalig tvättning av golv.*
	Temperaturkrav	*Utomhustemperatur*
	Värme	/
	Kyla	/
	Ventilationskrav	*Naturlig ventilation bör eftersträvas.*
	EL	
	El-Förbrukning	*Ljuskällor skall ha låg energiföbrrukning.* *Belysning skall vara effektivt placerad för att minska elanvändning.*
	Uttag	*Uttag för städ, reparatur etc. krävs.*
	Telefon	/
	Data	*Krav på WIFI*

MULTI-FUNKTIONELLT RUM (ca 35 m2)

FUNKTION	Syfte	*En plats för olika sorters möten, inspirtation och lärande.*
	Aktiviteter	*Samtal, föreläsningar och grupparbete (som t.ex. workshops).*
		Enklare permanenta och temporaära utställningar
		Fika och spontana och planerade sociala möten
		Möjlig plats för enklare Swop-shop (bytesaffär)
		Uppvisning av exempel på hur man återbrukar material i byggnader.
	Innehåll	*Ytor för uppvisning av hantverk*
		Information om byggnaden och Bråta
		Vägg- och golvyta för utställningsobjekt och swop-shop (t.ex. hyllor)
		Bord och stolar
		3 - 5 bord och stolar
		Kaffe och temaskin och plats för att ge pengar mot detta
		Kompost och andra sorteringskärl för avfall.
		Ljudanläggning
		Yta för möjlighet att använda projektor
	Förvaringsbehov	*Skåp för koppar och diverse för mindre café och städning.*
		Förvaring av bord och stolar bör planeras. Förslagsvis i ett hörn, i garaget, och/eller i sorteringsrumme.
RUMSLIGHET	Upplevelse	*En flexibel plats som kan användas på många olika sätt med få fasta möbler.*
		En naturlig mötes- och viloplats.
		Utsikt och insyn för att bjuda och locka in besökare i lokalen.
		En behaglig plats att vara på med inspirerande material och saker för återbruk.
	Sol och skugga	*Krav på rikligt med dagsljus året om.*
		Skugga bör användas för att undvika att det blir för varmt på sommaren.
		Solinstrålning bör användas som värmetillförsel på vintern.
	Belysning	*Belysning skall vara effektivt placerad för att skapa rumslighet och belysa olika aspekter av rummets material och kvalitéer.*
		Ljusnivåer bör kunna justeras.
		Punktbelysning på utställning och swop-shop kan krävas.
		Möjlighet att ändra antal och lägen av ljuskällor är också fördelaktigt.
	Ljudkrav	*Skyddat från högljuda aktiviteter.*
	Storlek	*ca 35 m2*
	Rumshöjd	*Minst 230 cm (högre tak kan ge mer utställningsyta)*
PLANERING	Läges- och sambandskrav	*Viktigt att vara nära inlämnings- och sorteringslokalen.*
		Fördelaktigt att vara nära entrén och/eller uteplatsen.
		Närhet till toalett behövs för café och andra sociala aktiviteter.
	Framtida planering	*Framtida utveckling av använding och storleksbehov ska tas i beaktande.*

RUMSFUNKTIONER

BRUKARE	Människor	*Användare och besökare till Bråtapaviljongen (se generella krav), som vill mer än bara lämna saker till återanvändning.* *Anställda på Bråta.* *Inbjudna föreläsare, konstnärer eller hantverkare*
	Djur och växter	/
INFORMATION & DELTAGANDE	Information	*Information om Bråta, byggnaden och materialen ska finnas i lokalen, antingen digitalt eller visuellt.* *Det är en plats för spridning och skapande av information.*
	Deltagande	*Möbler och föremål för utställningar kan vara gjorda av t.ex. kursdeltagare* *Social mötesplats* *En plats för lärande och sammarbete.*
MATERIAL *(Se även generella krav.)*	Kvalitetskrav	*Materialet ska inspirera och bidra till en atmosfär att trivas i.* *Materialet ska vara slittåligt, ha möjlighet att hänga t.ex. display och information, samt vara lättstädat.* *Krav på slittåligt golv.*
ENERGI & PRESTANDA *(Se även generella krav.)*	**VVS**	*(värme, ventilation och sanitet)*
	Sanitet	*Tvättställ/dsikho för att tvätta händer, vatten till kaffemaskin och disk för stöd av lättare caféverksamhet.*
	Varmvatten	*Krav på varmvatten till tvättställ / diskho.*
	Kallvatten	*Krav på kallvatten till tvättställ / diskho / kaffemaskin.*
	Avlopp	*Från tvättställ och diskho.* *Golvbrumm kan med fördel placeras nära kaffemaskin.*
	Temperaturkrav	*Inomhustemperatur krävs vid aktiviteter i lokalen.*
	Värme	*Lokalen bör vara uppvärmd*
	Kyla	*Lokalen bör hantera nerkylning på sommaren genom passiv teknik.*
	Ventilationskrav	*Naturlig ventilation bör eftersträvas.*
	EL	
	El-Förbrukning	*Ljuskällor skall ha låg energiföbrrukning.* *Belysning skall vara effektivt placerad för att minska elanvändning.*
	Uttag	*Uttag för lättare caféverksamhet, workshop, städ, reparationer etc. krävs.*
	Telefon	/
	Data	*Krav på WIFI*

UTEPLATSEN

FUNKTION	Syfte	*En naturlig mötesplats för aktiviteter eller vilostund utomhus.*
	Aktiviteter	*Spontana och planerade sociala möten* *Uthomhusfika om kaffe erbjuds i det multifunktionella rummet.* *Om utrymme finns kan även små utomhusaktiviteter ske här (hantverk, rengöring av material, workshops, och utställningar).* *Uppvisning av exempel på hur man återbrukar material i byggnader.*
	Innehåll	*Sittplats* *Hantverk och konst som tål att vara utomhus.*
	Förvaringsbehov	*I princip nej. Ev. förvaring för städmaterial (t.ex vattenslang).*
RUMSLIGHET	Upplevelse	*Uteplatsen skall skapa en upplevd rumslighet som stödjer samtal, guidade rundvisningar och med fördel också grupparbete.* *Den skall visuellt och upplevelsemässigt skilja sig från omgivningen; den behöver dock inte vara fysiskt avskild från omgivningen.* *Det skall vara en plats som känns som en paus i omgivningen, en naturlig mötes- och viloplats.* *Grönska kan med fördel planeras för att skapa en meningsfull och behaglig miljö.*
	Sol och skugga	*Soltillgång året om, och särskilt under kalla årstider.* *Skugga från träd eller tak kan vara fördelaktigt på varma dagar.*
	Belysning	*Belysning skall vara effektivt placerad för att skapa rumslighet, säkerhet och en effektfull upplevelse av platsen, och kan med fördel kunna variera i nivå.* *Utomhusbelysning för kvälls- eller vinteraktiviteter.*
	Ljudkrav	*Om möjligt, något skyddat från högljuda aktiviteter.*
	Storlek	*Det skall finnas utrymme för minst ett bord och stolar* *Utrymme för enkel utställning av konst eller hantverk* *Utrymme för att samla eller arbeta i grupp är fördelaktigt*
	Rumshöjd	/
PLANERING	Läges- och sambandskrav	*Viktigt att vara nära multi-funktionella rummet* *Kan vara en del av eller nära entrén och bidra till att skapa en välkomnande effekt.* *Kan vara fördelaktigt att ha utsikt över Bråta för att från en central plats kunna se och få information om hela området*
	Framtida planering	*Framtida utveckling av använding och storleksbehov ska tas i beaktande.*
BRUKARE	Människor	*Användare och besökare till Bråtapaviljongen (se generella krav), som vill mer än bara lämna saker till återanvändning.* *Anställda på Bråta.* *Inbjudna föreläsare, konstnärer eller hantverkare*
	Djur och växter	*Exteriöra utrymmen kan använads för att skapa små viloplatser och habitat för insekter och fåglar genom att använda växtlighet där det är lämpligt.*

RUMSFUNKTIONER

INFORMATION & DELTAGANDE	Information	*Plats för att få information om paviljongen och Bråta som helhet.*
	Deltagande	*Möbler och föremål för utställningar kan vara gjorda av t.ex. kursdeltagare* *Social mötesplats* *En plats för lärande och sammarbete.*
MATERIAL *(Se även generella krav.)*	Kvalitetskrav	*Materialen skall vara slittåliga och tåla väder.* *Vattengenomtränglig markbeläggning där möjligt.*
ENERGI & PRESTANDA *(Se även generella krav.)*	**VVS**	*(värme, ventilation och sanitet)*
	Sanitet	/
	Varmvatten	/
	Kallvatten	*Kan vara en lämplig plats för utomhuskran.*
	Avlopp	*Vattenavrinning till andra områden bör försöka undvikas genom att ha en vattengenomtränglig markbeläggning och växtlighet.*
	Temperaturkrav	/
	Värme	/
	Kyla	/
	Ventilationskrav	*Bör hållas borta från illaluktande eller kemiska ångor, samt från områden där damm och smuts kan blåsa på besökarna.*
	EL	
	El-Förbrukning	*Ljuskällor skall ha låg energiförbrukning.* *Belysning skall vara effektivt placerad för att minska elanvändning.*
	Uttag	*El för utomhusaktiviteter såsom workshops, föreläsningar, städ och reparationer krävs.*
	Telefon	/
	Data	*Krav på WIFI*

TEKNIKRUM (1- 4 m2)

FUNKTION	Syfte	*Teknikrummet samlar all teknik och synliggör den i paviljongen och bidrar till inspiration och intresse för byggnadens tekniska stategier.* *Om ingen specifik teknik används i paviljongen skall yta för framtida teknik planeras.*
	Aktiviteter	*Uppvisning av teknik* *Reperation och underhåll*
	Innehåll	*Tekniska instrument* *Informationskyltar*
	Förvaringsbehov	/
RUMSLIGHET	Upplevelse	*En ovanlig upplevelse som kan inspirera och lära ut hur olika teknik kan användas för att minska energiförbrukning.*
	Sol och skugga	/
	Belysning	*Belysning bör synliggöra tekniken på ett effektfullt och informativt sett.*
	Ljudkrav	*Oönskat buller bör inte spridas till övriga lokaler.*
	Storlek	*1-4m2 (Beroende på val av teknik)*
	Rumshöjd	*Minst 230 cm*
PLANERING	Läges- och sambandskrav	*Teknikrummet bör vara synligt för att informationen ska spridas.* *Fördelaktigt om det är centralt beläget.* *Krav på att tekniken ska samplaneras med övrig teknik på platsen.*
	Framtida planering	*Krav på att eventuella framtida utveckling och behov av teknik på platsen tas i beaktande.*
BRUKARE	Människor	*Anställda* *Inhyrd service/teknisk support*
	Djur och växter	/
INFORMATION OCH DELTAGANDE	Information	*Information om tekniken i paviljongen ska visas, antingen digitalt eller visuellt.* *Tekniken och systemen ska vara synliga med syfte att informera.*
	Deltagande	/

RIKTLINJER FÖR INSAMLING AV BYGGMATERIAL

(på Bråta Återvinningscentral)

GENERELLA RIKTLINJER

1. Vid insamling av byggmaterial finns generella karaktärsdrag att ta hänsyn till:
   - storlek
   - form
   - antalet objekt som är samma/liknande
   - graden av åldrande
   - om de är kombinerade med andra material och i så fall om de är lätta att ta isär

2. Generellt ska objekt som är mindre än de som beskrivs i detta dokument inte samlas in. Däremot kan de samlas in om liknande/samma objekt kommer i stora mängder.

3. Allt byggmaterial som är nytt ska samlas in.

4. Insamlat material ska skyddas från regn om så krävs.

5. Material som inte beskrivs i detta dokument men verkar vara intressant för framtida projekt lagras och kommuniceras med designteamet (ex. foto och e-post)

6. Insamlingsprocessen ska dokumenteras, speciellt svårigheter som uppkommer längs vägen. En loggbok för dagliga anteckningar är att föredra (ex. Excel-fil). Den kommer skall innehålla en kort beskrivning av vad som har samlats in och den ungefärliga mängden av varje artikel den dagen.

RIKTLINJER FÖR SPECIFIKA MATERIAL

TRÄ
-ej mögligt/ruttet
-ej mer än 10 metallbitar/m eller m2, samt lätt att ta bort metallen
-längd på brädor/pinnar: större än 50cm, diameter: större än 2cm
-skivor: större än 40x40cm

STEN
-cement, om påsen är minst halvfull
-tegel,betong, grus and plattor i alla dimensioner (spara småbitar vid stora mängder).
-tegel och kakel tas tillvara oavsett skick (dock max 10% kombinerat med murbruk)

METALL
-längd på stänger/pinnar: större än 40 cm, oavsett diameter
-plåt större än 20x20cm
-all metalltråd längre än 50cm.

GLAS
-alla speglar oavsett skick
-glasskivor: tjocka (ej tunna och ömtåliga)

ISOLERING

- fräsch (i stort sett oanvänt) mineralull, cellplast och fiberisolering (minst 50x50 cm)

FÖNSTER OCH DÖRRAR
- alla solida dörrar oavsett skick, ihåliga dörrar bara i bra skick
- fönster:
    *vid dubbel- och treglas bör glasen vara intakta
    *vid enkelglas kan glaset vara trasigt

JORD
-om det kommer i stora mängder

GIPSSKIVOR
-dimensionerna bör vara minst 1/2 standardskiva - ca. 120x120cm
-bra skick och ej egendomliga former

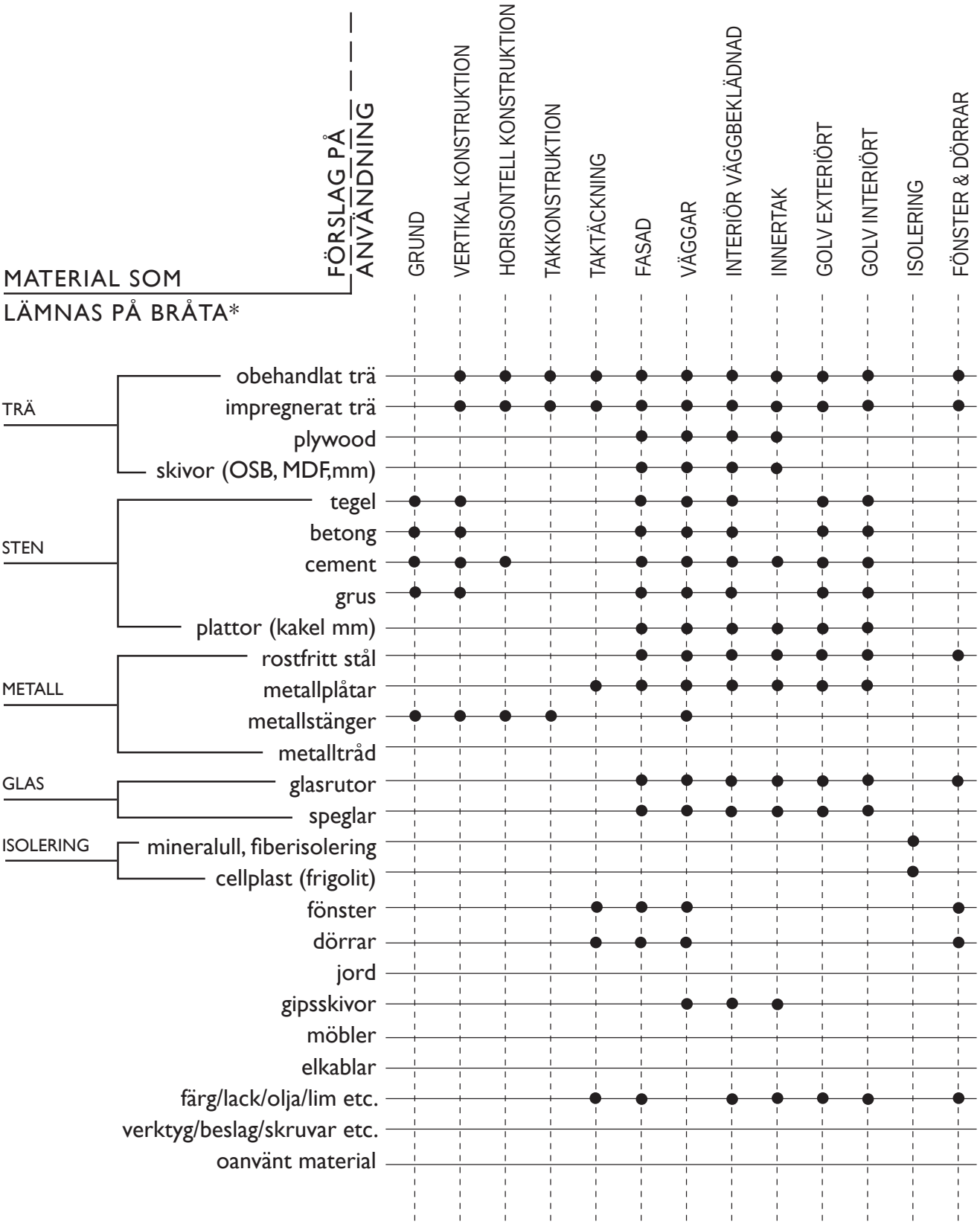
MÖBLER
- om det finns potential att använda delar av dem. Dessa delar ska vara enkla att ta isär för att efteråt passa in i någon av de kategorier av material som anges i första sidan av kapitlet om materialval.

ELKABLAR
- alla som är i gott skick och för husbruk (längre än 4m)

FÄRG/LACK/OLJA/LIM ETC.
- allt som är användbart

VERKTYG/BESLAG/SPIK ETC.
- alla verktyg som är användbara
- spik, beslag, skruvar om de är nya

MÖJLIG ANVÄNDNING AV MATERIAL PÅ BRÅTA ÅVC



*enligt studentrapporterna från SUSTAINABLE BUILDING studio Våren 2014 CHALMERS ARKITEKTUR

CHALMERS ARKITEKTUR, MPDSP Master Programme

Sustainable Building Studio
SYNTHESIS

In the spring term of 2014 the goals and visions of Bråta and the research topic became the in-depth project for a master´s studio focusing on regenerative design strategies. The following chapter is a synthesis of the studio topics and work conducted with the objective of extracting useful elements and questions that could help inform the actual programme and design for *Bråtapaviljongen.*

BACKGROUND

In the spring term of 2014 reconsidering Bråta recycling centre became the in-depth project for the Sustainable Building Studio run by Barbara Rubino within the master's programme Design for Sustainable Development at Chalmers University of Technology. Students at the master's level come from many different countries and all work is conducted in English. This section of the report has been kept in that language to simplify the synthesis of the student work.

The design studio was, for the first time ever, using regenerative design strategies as a central theme throughout the course. Students conducted a number of workshops and smaller projects to explore regenerative design principles and were introduced to the concepts and central themes of Sigrid Östlund's doctoral research before receiving Bråta as their final assignment. As the final assignment of a design studio must give the opportunity for students to test and show all that they have learned during the course, the project requirements were therefore added to include regenerative design principles. They were also given less restrictions with regards to budget, site limits and asked to consider a long term perspective. In addition to the original problem definition of a building made from and for the reuse of construction materials and household items, they were challenged with the objective to make Bråta a centre for regenerative technologies and placemaking, A copy of the specific assignment guidelines and objectives the students received is found in the reference section at the end of this report.

INTRODUCING REGENERATIVE PLACEMAKING

Regenerative design advocates a focus on the 'glocal' conditions of place and a fruitful relationship between the key principles and needs of ecosystems and society. In order to contribute to the discussion of the viability of regenerative design strategies, the research focuses on the relationship between regenerative material cycles and placemaking. In particular: the design of spaces which include waste-to-resource principles, and how this is informed by, or informs, the glocal sense-of-place and community. It is ultimately a reflection on how the designer's process is affected by, and affects, the particularities of spatial configurations, forms and strategies that support a culture of reuse and regenerative placemaking.

Purpose:
Define and investigate regenerative design strategies for integrating the glocal condition of placemaking and resource cycles with the design of public spaces.

Simplified research questions:
1. How does regenerative design affect placemaking in public spaces?
2. How can the architect integrate and use regenerative cycles in the design of public spaces?

PLACE MAKING

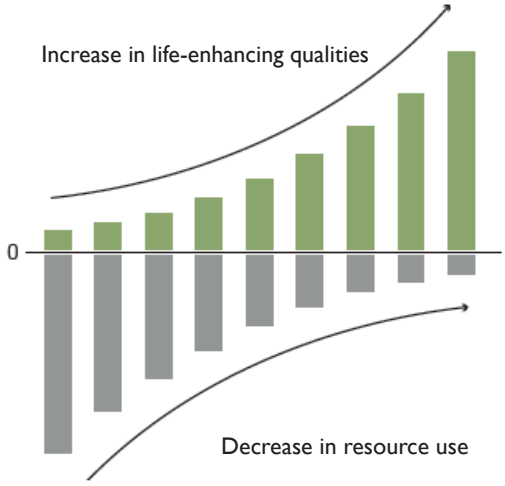
The experience of 'sense of place' is an important element in the way humans inhabit and understand the world they live in, and it is one of the key elements to consider in successful spatial design. Our minds have a natural tendency to find and create meaning in the things around us. The meaningfulness of a thing is derived from our physical experience of an object, the context of the object, as well as the societal and individual values and experiences a person may have. 'Sense of place' is, therefore, a product of the actual form and composition of the physical environment, its affect on our biological sensory mechanisms and the symbolic or metaphorical associations our mind makes to that physical environment.

Placemaking is the act of creating a 'sense of place'. Placemaking can occur in the private sphere, however this project, and the doctoral research related to it, is interested in the collective placemaking done in the public sphere. Public placemaking is the productive meeting between society's capacity to create meaning from the physical environment and the actual form of the physical environment, which architecture and urban design help to form. Designers have strategies and tools that help to insinuate

a certain meaning, but it is always a dialogue in the end. According to this philosophy, spatial design's primary purpose is to facilitate placemaking, i.e. meaning making, that fosters and enhances the quality of life in a community.

REGENERATIVE DESIGN

'Regenerative design' is a paradigm developed from questioning the ability for the 'sustainable design paradigm' as it is being practiced and interpreted in society today to adequately provide and foster an improved quality of life and equitable future. In its essence it is a shift from a heavy focus on reducing and limitations on energy and resource use to a focus which balances the reduction of resource use and the production of life-enhancing elements.



Regenerative design principles according to GXN research group within 3XN architectural firm

"A durable architecture need only delay the inevitability of decay. A sustainable architecture need only maintain the status quo of natural carrying capacity. A regenerative architecture, however, must concern itself with the reproduction of the institutional agreements that tie humans to the ecological conditions of a place." (Steven A. Moore 2001)

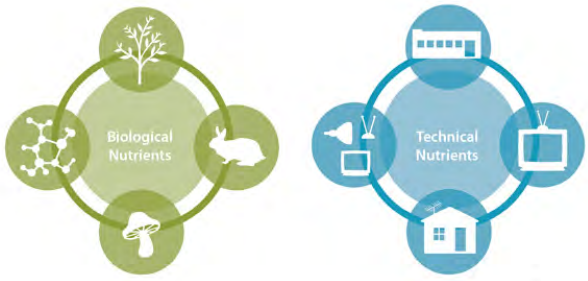
"[The regenerative sustainability paradigm] aims to restore and regenerate the global social-ecological system through a set of localized ecological design and engineering practices rooted in the context and its social ecological narratives." (Chrisna Du Plessis, 2011)

REGENERATIVE TECHNOLOGY

"Regenerative technology adds to the economic, ecological, and social dimensions of sustainable technology...in two ways: First, regenerative technologies are socially visible and politically transparent... Second, where sustainable technologies require only that the status quo of production/consumption be attained, regenerative technologies require a net increase in life enhancing conditions. [It is not limited to passive technology and does not] prohibit highly sophisticated material processes."
(Steven A. Moore 2001)

CRADLE TO CRADLE (C2C)

C2C is a design methodology that has been developed by William McDonough (architect) and Michael Braungart (chemist) for industrial and architectural design. The central theme is that we must shift to a paradigm where waste equals food, and all things that are discarded must be 'digestible' in the biological or technical cycles. In the biological cycle materials become food for plants, animals and humans; in the technical cycle materials are converted into new materials and products. C2C has gained a lot of recognition in industry, and is now gaining momentum in community development and architecture. The leading sustainability certification systems for buildings (LEED and BREEAM) are investigating how to include C2C principles. While C2C is well developed as a design methodology, and fits within the philosophy of regenerative design, it unfortunately does not specifically address placemaking.



The biological and technical loop
Michael Braungart and William McDonough

ANALYSIS OF STUDENT WORK

While the design problem given to the students needed some adjustment in order to fill the course objectives, the projects brought to light a number of issues and possibilities for redesigning the places and way we handle resources in a regenerative way. This chapter is a synthesis of the studio topics and student work. The synthesis was done with the objective of extracting useful elements and questions that could help inform the actual programme and design for *Bråtapaviljongen.*

PROGRAMME CATEGORIES

While extracting issues, ideas and elements from the student projects a number of programme categories were identified (shown in red in the diagram to the right). These were then divided into four areas of applicability.

AREAS OF APPLICABILITY

1. Site and Context Analysis
A synthesis of the problem in its larger and local context and the different elements and conditions that define the character and function of Bråta.

2. Essential Considerations for the Design
A synthesis of issues that are particularly applicable and/or important to consider for the programme and design of *Bråtapaviljongen.*

3. Possible Considerations for the Design
A synthesis of issues considered less essential as they are deemed a bit more advanced then the basic needs for the pavilion, however they could become elements of the final design if the design and budget shows that it is possible or even necessary.

4. Future Considerations for the Design
A synthesis of issues that are not possible for the present project, but are interesting concepts that suggest progressive ways to take Bråta to the next level in terms of affecting resource use, repositioning the centre's way of relating to the community and creating a memorable and pleasant spatial experience. Future possibilities could, however, affect current design choices and should therefore be considered and discussed.

APPROACH & ANALYSIS

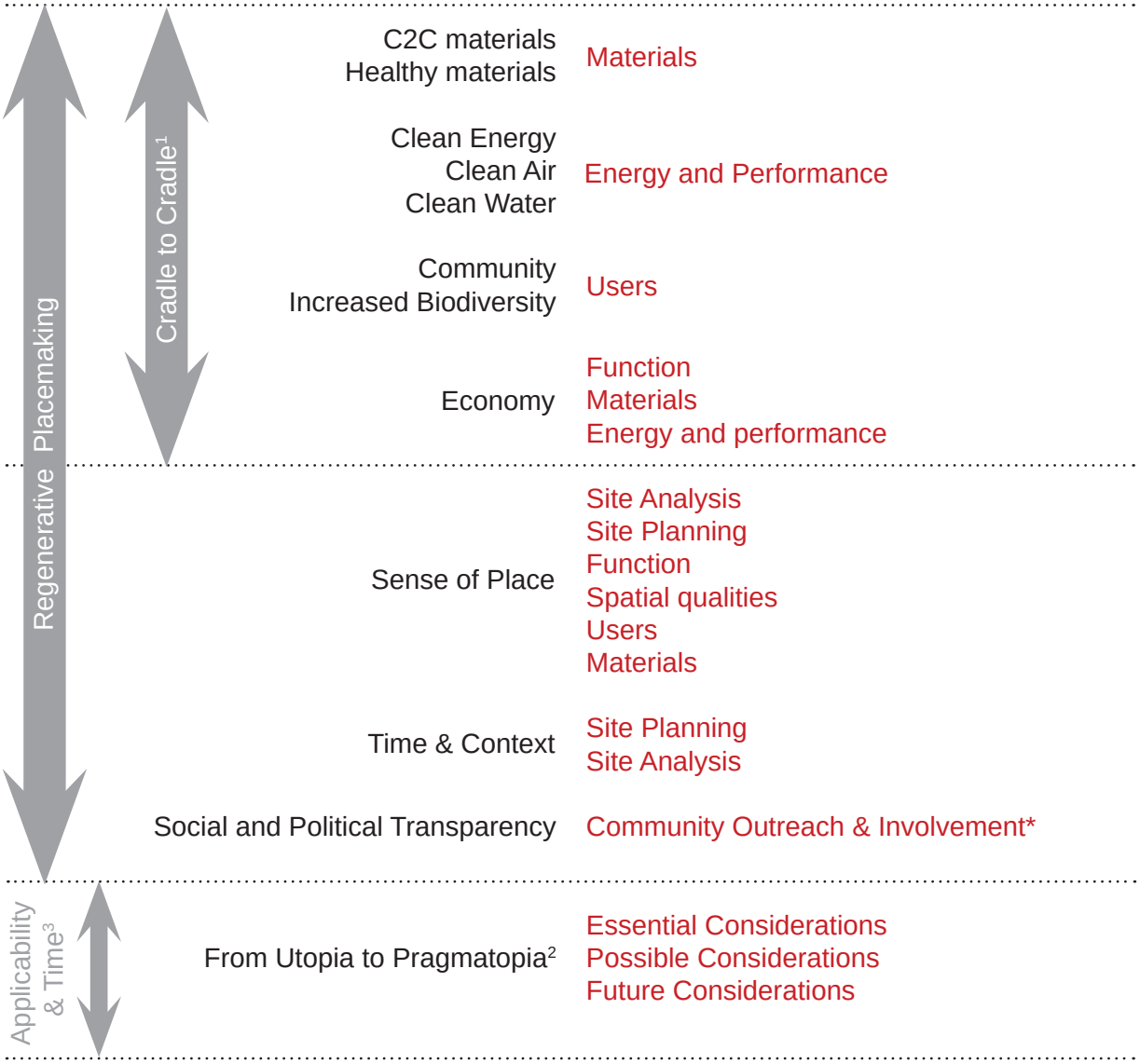
THEORY & RESEARCH CATEGORIES

The categories below reflect three major threads of inquiry present in the doctoral research study which runs parallel to the design studio and the design project. The students were presented with these concepts and were asked to consider them in the development of their proposals.

PROGRAMME CATEGORIES

The categories below were developed from the work of trying to extract useful elements and strategies for the development of the programme for the actual project to be realized at Bråta.

The diagram below shows how they relate to the theoretical and research categories.



[1] Cradle to Cradle (C2C) design principles for the built environment developed by GXN research group and endorsed by Michael Braungart and William McDonough (the originators of C2C design philosophy). These contribute to but do not encompass the full complexity of 'regenerative placemaking'.

[2] The students were encouraged to develop their concepts with a utopian outlook of limitless possibilities of the entire site; the *Bråtapaviljong* design group is charged with finding a pragmatic approach to divining the possibilities within a single building intervention on the site and its role in future developments.

[3] These three categories were chosen to define how relevant a design strategy from the Sustainable Building Studio were to the development of a programme for *Bråtapaviljongen.*

A SUMMARY OF STUDENT VISIONS

The student projects from the studio "Sustainable Building" include a number of visions for how recycling centres can be reinterpreted, become a more poignant public space in the urban landscape, as well as have a greater influence on society's use and management of resources. These have been reinterpreted into underlying common themes and are categorized under a broader topic in the list below. The student's visions are a development from the project description they received from Härryda, the requirements of the course assignment and the theory of Regenerative Design that was presented to them during the course. (See the course assignment description p. 93)

SHIFTING THE WASTE PARADIGM
- reconsidering the 'waste ladder'
- 'waste = food' / 'cradle-to-cradle' / biological and technical cycles
- use local resources of wind, sun and water wisely

REGENERATIVE DESIGN AND ARCHITECTURE'S TRANSFORMATIVE ROLE
- communicate and educate
- inspire and enhance
- facilitate and connect

THE ASPECT AND INFLUENCE OF TIME
- past, present and future paradigms
- activity flux and variation (day, season, era)
- structural/material permanence versus flexibility

RELATING TO PHYSICAL CONTEXT (LANDSCAPE & BUILT ENVIRONMENT)
- physical connections and boarders
- conceptual and experiential connections and boarders
- functional connections and boarders

SHIFT FROM PERIPHERY TO HUB
- repositioning the concept and function of recycling centres in society
- a hub of activity
- the heart of the community's material cycle
- a centre for information and education
- a showcase of regenerative (sustainable) strategies and technologies

RELATING TO THE 'GLOCAL' CONTEXT
- global and local influences on resource availability and use
- 'think globally, act locally'
- an example to inspire other communities but respond to local conditions
- virtual (internet) and community presence

INCLUSION AND DIVERSITY
- user needs and roles
- demographics (age, income, gender, transport needs, etc.)
- human habitat versus animal habitat
- diversity of activities (commercial, social, creative, educational, recreational, etc.)

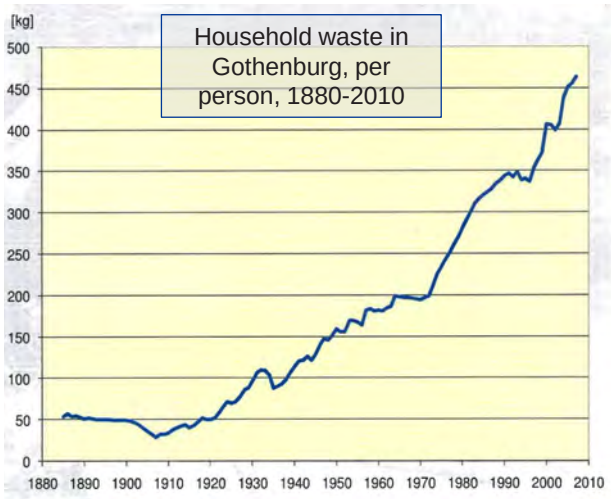
SITE & CONTEXT ANALYSIS

Site and context analysis is the work students did in order to understand the problems they needed to address, find hidden potentials and to identify the different elements and conditions that define the character and function of Bråta.

Group 1: What a Waste

THE PROBLEM IN GOTHENBURG

The illustrative pile of municipal solid waste to the right is not only growing due to population growth in the city, but also to different life styles and habits as can be seen in the graph below.



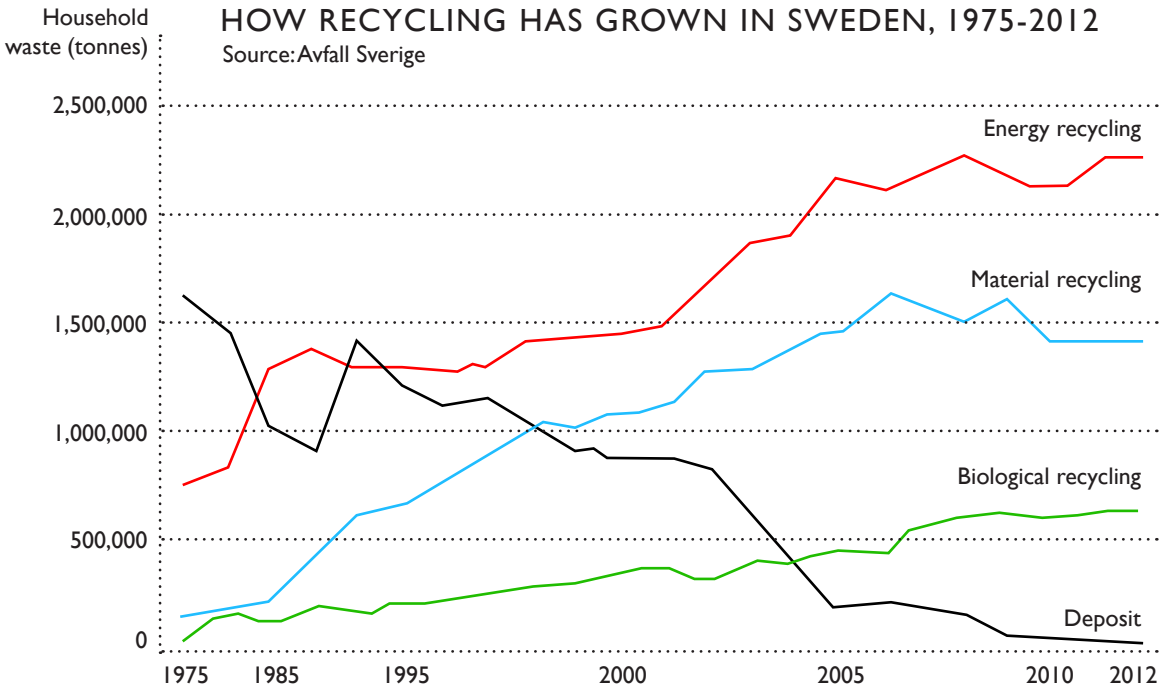
Source: Renova

Gothenburg 2008 Municipal Waste Statistics (Renova)
Weight: 230 400 tonnes
Volume: 1680 000 m^3
Height: ca 170m
76% went to energy recovery, 22% to material recycling and 2% to composting.

SWEDEN'S RECYCLING PROGRAMME

Sweden's recycling programme, which Bråta is a part of, has made many advances been very effective at reducing deposits of waste. However, incineration has been the key resource recovery method and is a less desirable method then material and biological recycling.

HOW RECYCLING HAS GROWN IN SWEDEN, 1975-2012
Source: Avfall Sverige



BUILDINGS & MATERIAL RESOURCES

40% of all energy and material resources are used to build and operate buildings globally. According to *Naturvårdsverket* the construction sector is responsible for 40% of all waste in Sweden and is a priority for the future national waste plan. The EU has taken a strong stance on this issue stating that "reuse, material recycling and other recycling (not including energy extraction) of non-toxic construction and demolition waste shall…increase to a minimum of 70 weight-based percentile before 2020." To achieve this goal *Naturvårdsverket* places special emphasis on the need for "contractors, builders and developers [to] reduce the amount of waste, reuse more materials and improve the sorting of waste." (www.naturvardsverket.se)

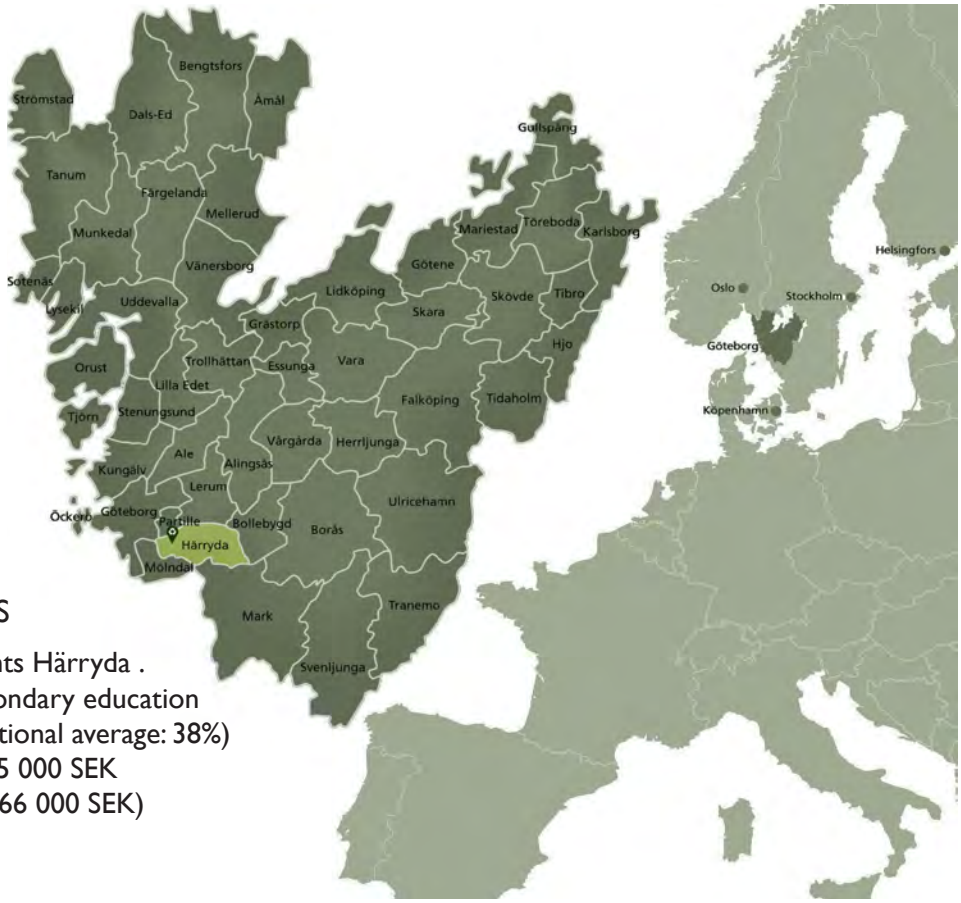
"Construction and demolition waste is one of the heaviest and most voluminous waste streams generated in the EU. It...consists of numerous materials, including concrete, bricks, gypsum, wood, glass, metals, plastic, solvents, asbestos and excavated soil, many of which can be recycled…Construction and demolition waste has been identified as a priority waste stream by the European Union. There is a high potential for recycling and re-use of CDW, since some of its components have a high resource value. In particular, there is a re-use market for aggregates derived from CDW waste in roads, drainage and other construction projects. In addition, technology for the separation and recovery of construction and demolition waste is well established, readily accessible and in general inexpensive." (http://ec.europa.eu/environment/waste/construction_demolition.htm)

What is it that makes the recycling of construction waste vary so greatly, and why is Sweden so poor at it when they have been so advanced in other recycling techniques? What can a municipality like Härryda do to the locally produced construction waste until this national system hopefully one day exists in Sweden?

EU DIRECTIVE TARGETS TO BE ACHIEVED BY 2020:

'50% preparing for re-use and recycling of certain waste materials from households'
'70% preparing for re-use, recycling and other recovery of construction and demolition waste'
(http://ec.europa.eu/environment/waste/framework/)

GLOBAL CONTEXT



DEMOGRAPHICS

- ca 35 700 inhabitants Härryda .
- 44% have post-secondary education (higher than the national average: 38%)
- Median income: 305 000 SEK (national average: 266 000 SEK)
- 75% live in villas

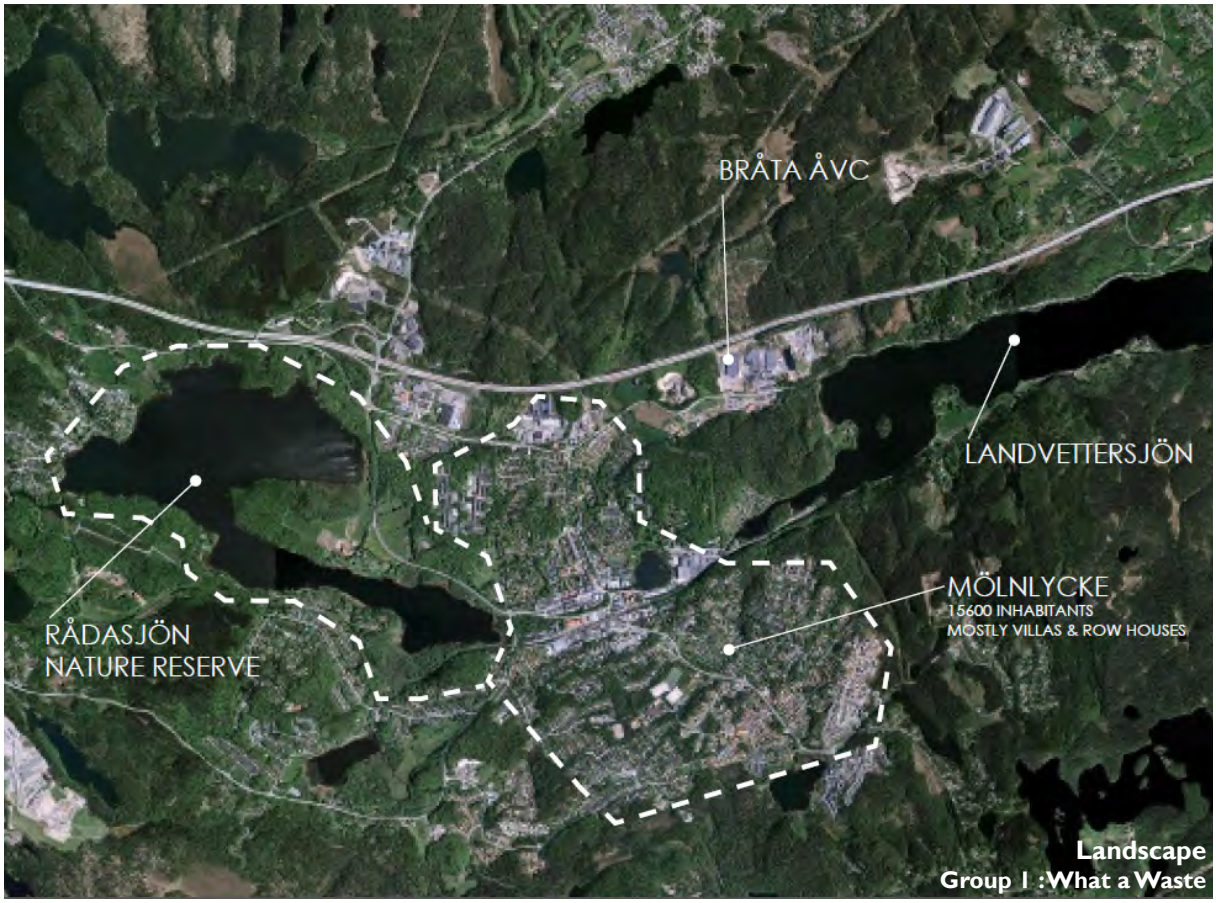
Near Göteborg
Group 1: What a Waste

DESCRIPTION

The largest community in Härryda municipality is Mölnlycke (ca. 15 608 inhabitants) which is 10 km from Göteborg, making it a convenient commuter town for many who work in Göteborg. It also is near Landvetter airport which employs a great number of people.

Härryda began as a farming and forestry based economy, which was then complimented by specialty craftsmen located at different farms. The industrial revolution arrived in the form a textile industry and Mölnlycke later became famous for its furniture making.

LOCAL CONTEXT

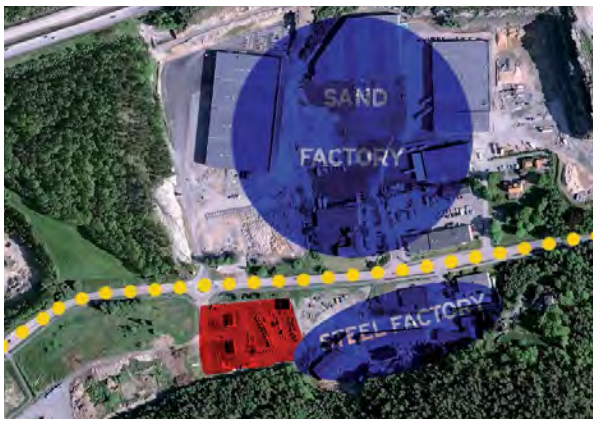


Neighbouring nature areas
Group 4: The Tree

COMPOSITION OF LANDSCAPE

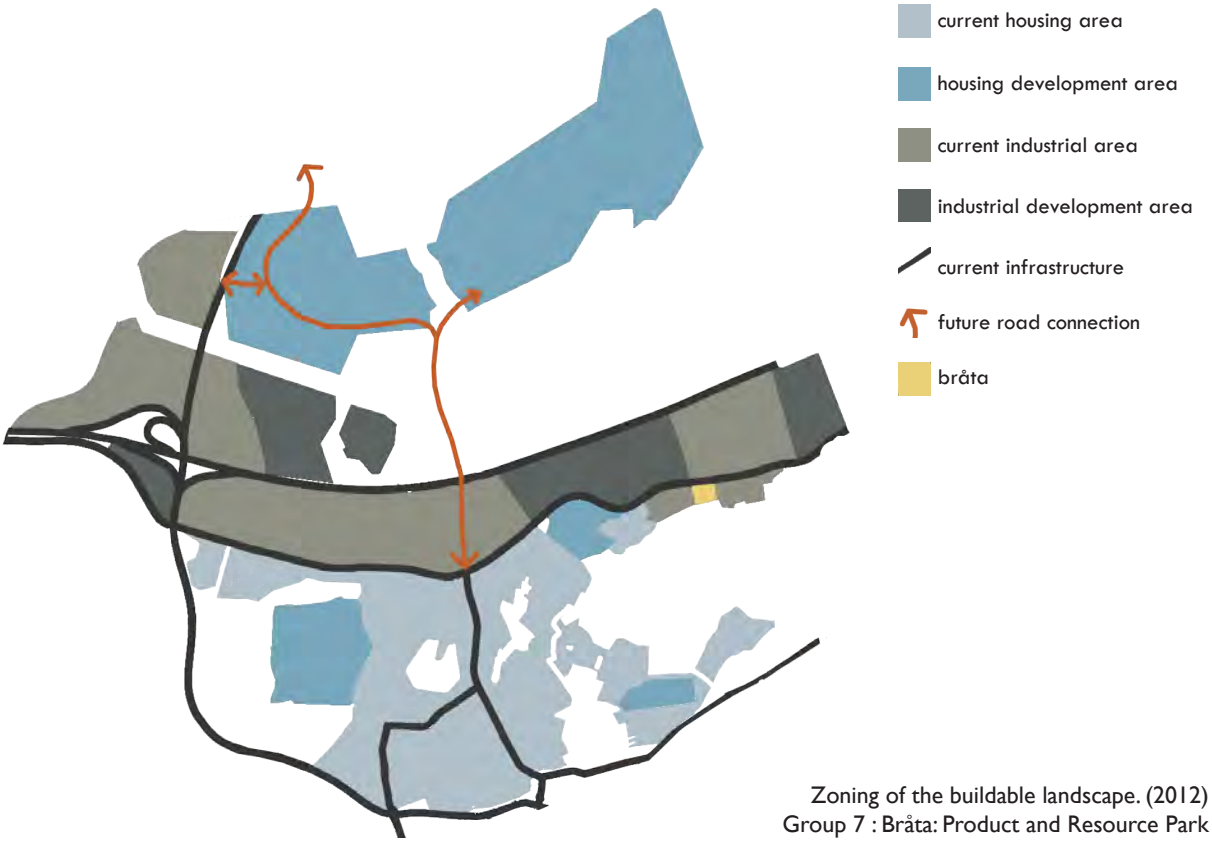
Bråta is near Mölnlycke in a small industrial area between two nature areas and highway E40, The area's lakes and forests are a local source of pride for the local community and are popular recreation areas.

The site is bordered by farmland to the west, industry to the north and east, and nature to the south and north-west.

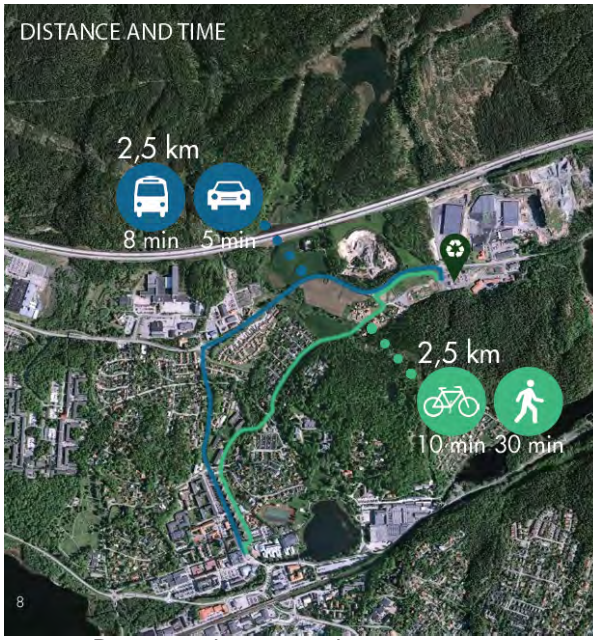


Neighbouring industries (blue) Bråta (red)
Group 10: Regenerative Recycle Centre Bråta

HÄRRYDA DEVELOPMENT PLANS



Zoning of the buildable landscape. (2012)
Group 7 : Bråta: Product and Resource Park



Distance and time according to transportation type
from Mölnlycke to Bråta
Group 5: Bråta

There are two bus-stops near bråta, 250 and 300m away from the centre.

VISITING THE SITE

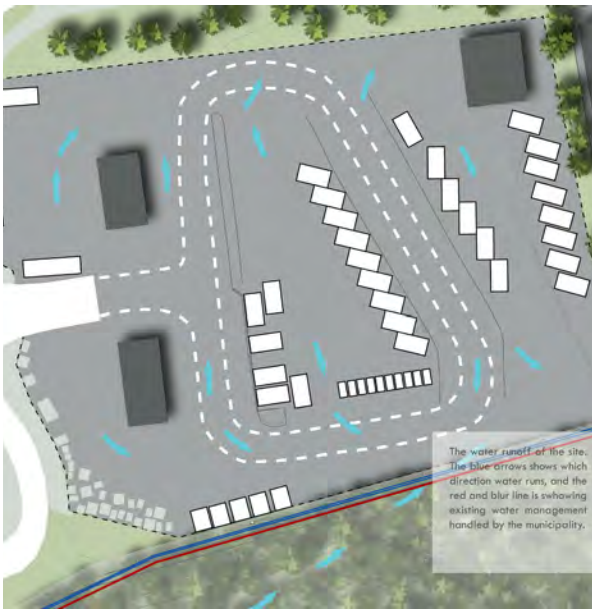
It is possible to get to Bråta by bicycle and bus, but there is not very much reason to do so as the functions and the site itself require a car and are not bicycle or pedestrian friendly.

100 000 cars visit Bråta per year, 274 cars a day on average. Mostly there is only one person in the car and most come on sunny days. Most visitors are middle aged men. This is quite a lot, especially when compared to the much larger and more famous, *Alelyckan Kretsloppspark,* which averages around 60 cars per day. Alelyckan, also has a more varied type of visitor in age and gender.

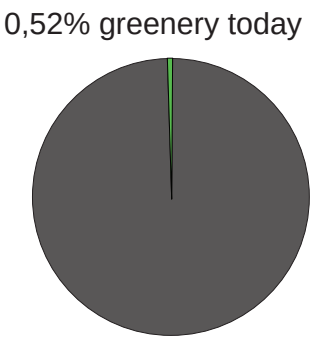
CURRENT SITUATION

THE SITE

The site is a completely paved area where all natural elements are eliminated, which gives the impression of a dead environment. Ironically this reflects the way we see waste as well, as 'dead', and so the site becomes an expression of our mindset about waste. Just as we desire to disconnect waste and unwanted items from our environment, this place also expresses a desire to be completely disconnected from its context.



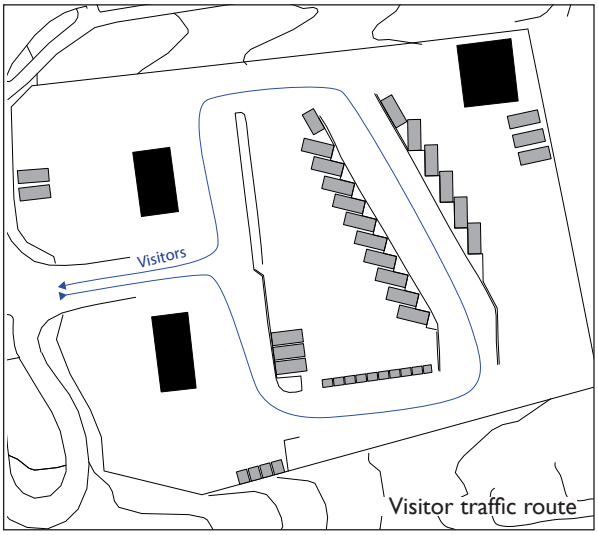
Water run off directions on site
Group 7 : Bråta: Product and Resource Park



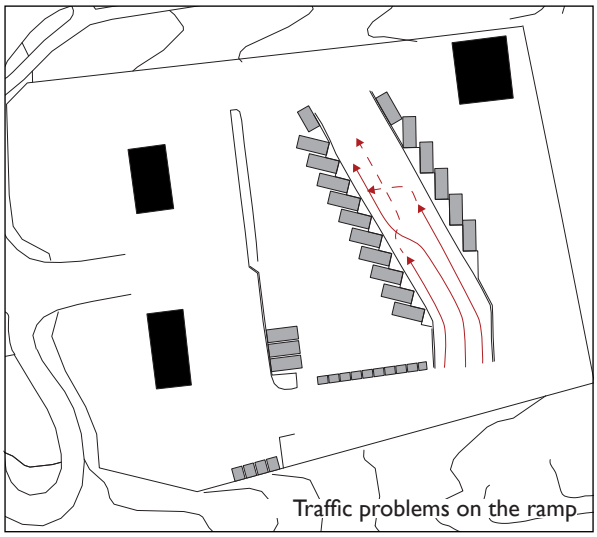
Group 8: Simply a Roof

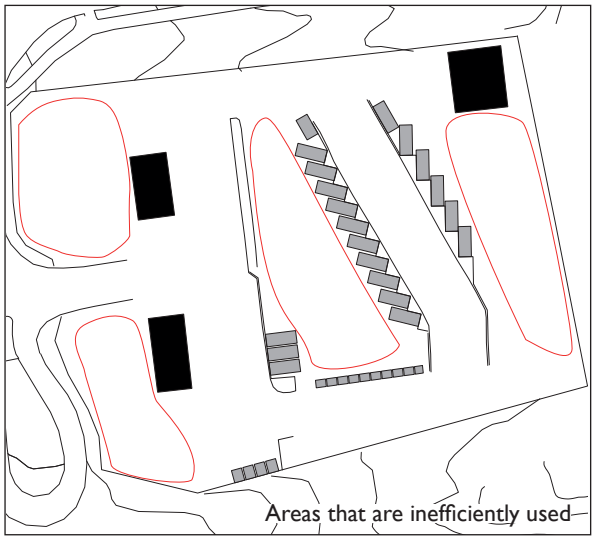
LOGISTICS AND TRAFFIC

Currently Bråta has100 000 vehicles per year (274 per day) visiting the site.



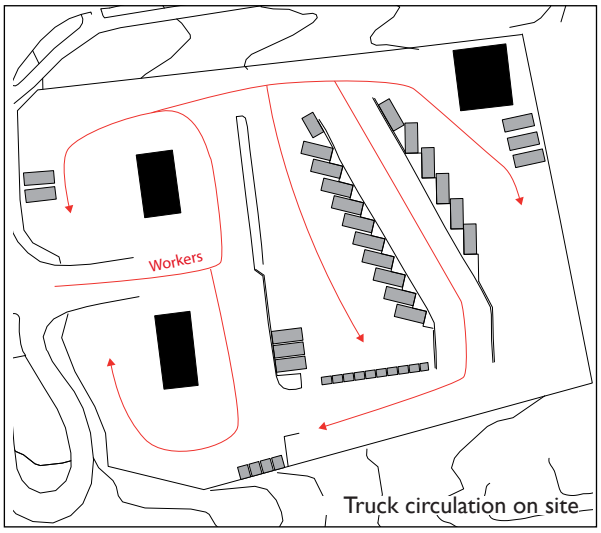
Visitor traffic route


Traffic problems on the ramp

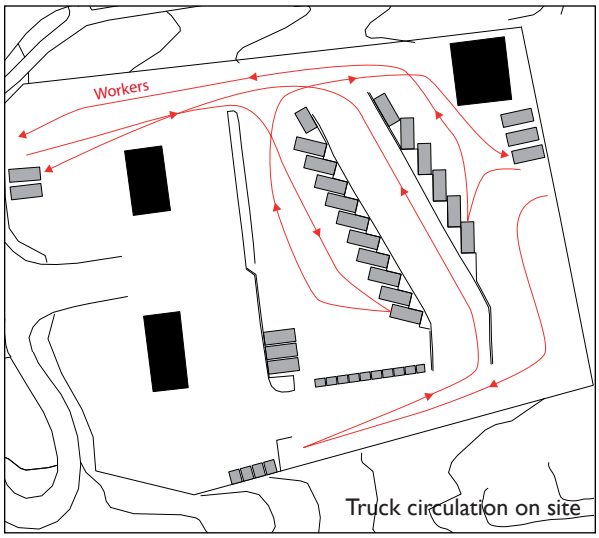

Areas that are inefficiently used

WORKERS

Bråta is manned by two or three persons from the company Allfrakt AB who give advice on sorting, direct traffic and coordinate the trucks that transport the waste from the central.



Truck circulation on site

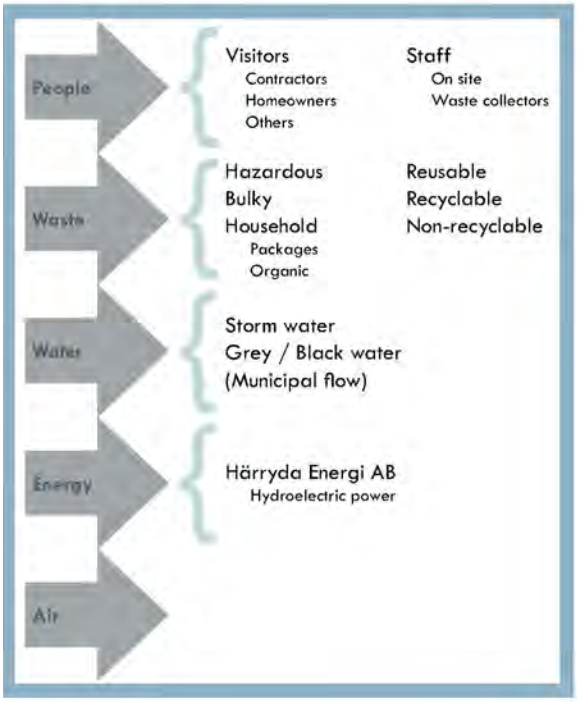


Truck circulation on site

INEFFICIENTLY USED AREAS

As the students began to investigate the potential of different arrangements of the site, they discovered and confirmed that there were several areas that were not being used very efficiently due to the organization of the traffic flow on site.

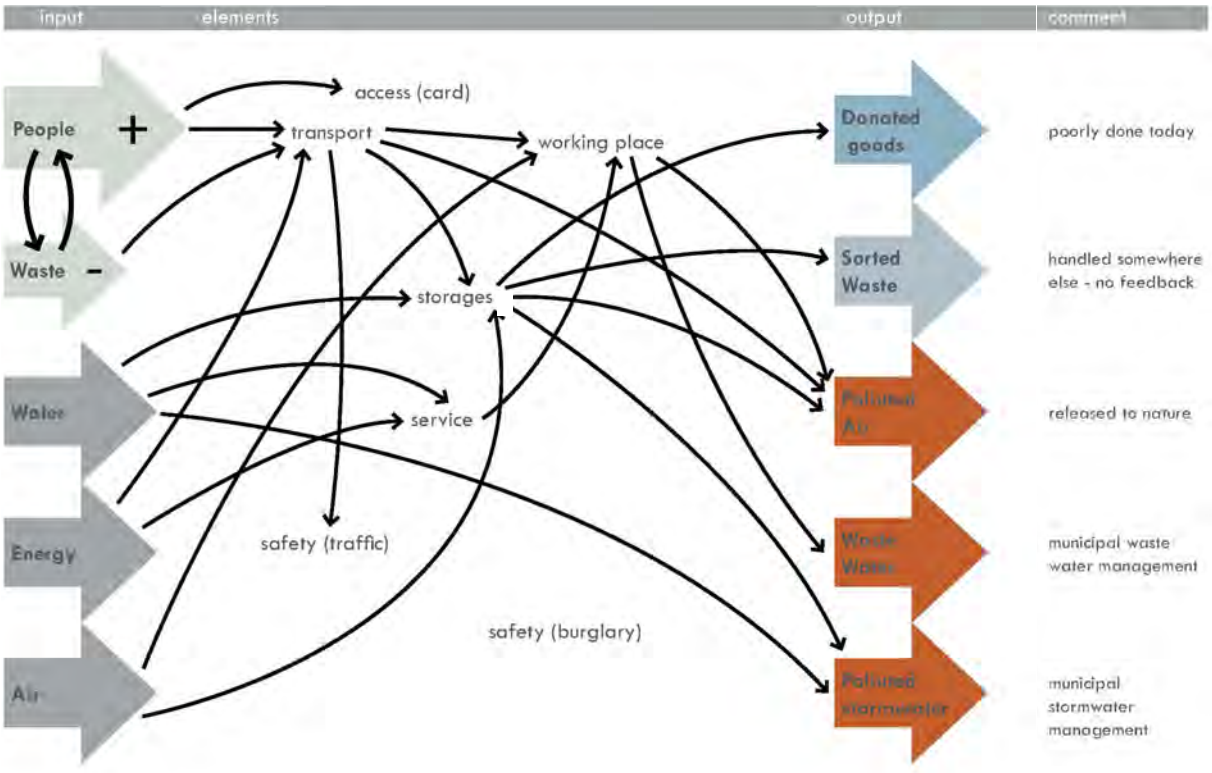
Group 10: Regenerative Recycle Centre Bråta



BRÅTA SYSTEM INPUTS & OUTPUTS

The site has a number of 'inputs' and 'outputs' and interrelations between these that are important to understand as they could affect the goals, visions and operations of any added function to the site.

Group 7 used systems analysis to investigate a number of interrelations more deeply and to understand how their design interventions might affect the system and perception of waste on site and in the community.



A systems analysis to understand the interrelations of the basic elements on site
Group 7 : Bråta: Product and Resource Park

BRÅTA STATISTICS

The waste composition shows that there is a lot of remodelling of homes and gardens in the area.

Total waste collected at Bråta amounts to 211kg/ person/year.

reused	200 tons/year
composted	426 tons/year
recycled	1312 tons/year
incinerated	5384 tons/year
landfilled	1287 tons/year
total:	8609 tons/year

(Numbers based on the presentation by Hagman, 2014)

current waste management at Bråta

process	material		
(a) reused	reusable textiles (clother and shoes etc.) building materials	other reusable materials (furniture, bicycles, electronics etc.)	
(b) composted	compostable waste (topsoil, grass clippings, flowers, leaves)		
(c) recycled	packages (paper, glass, plastics, metal) newspapers corrugated paper	iron and metal gypsum shortening stainless steel	light sources* electronics* appliances (white goods)*
	tires without rims tires with rims building materials	batteries* cables* aerosols (spray bottles)*	
(d) incinerated	combustible waste (plastic, styrofoam, textiles, mattresses) textiles twigs and branches	wood impregnated wood upholstered furniture	paints, varnish, glue* poisons and pesticides* solvent*
(e) landfilled	non-combustible waste (mineral wool, mirrors, plumbing porcelain) corrosive substances*	brick and concrete (stone, tiles, roofing tiles, asphalt, tile, porcelain)	

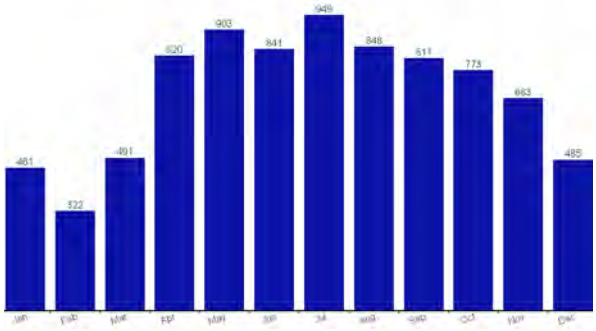
* Products or materials that are either hazardous or / and need special treatment. Some of these also have many components; these are placed in the category where most of the materials of the product will end up.

Group 7 : Bråta: Product and Resource Park

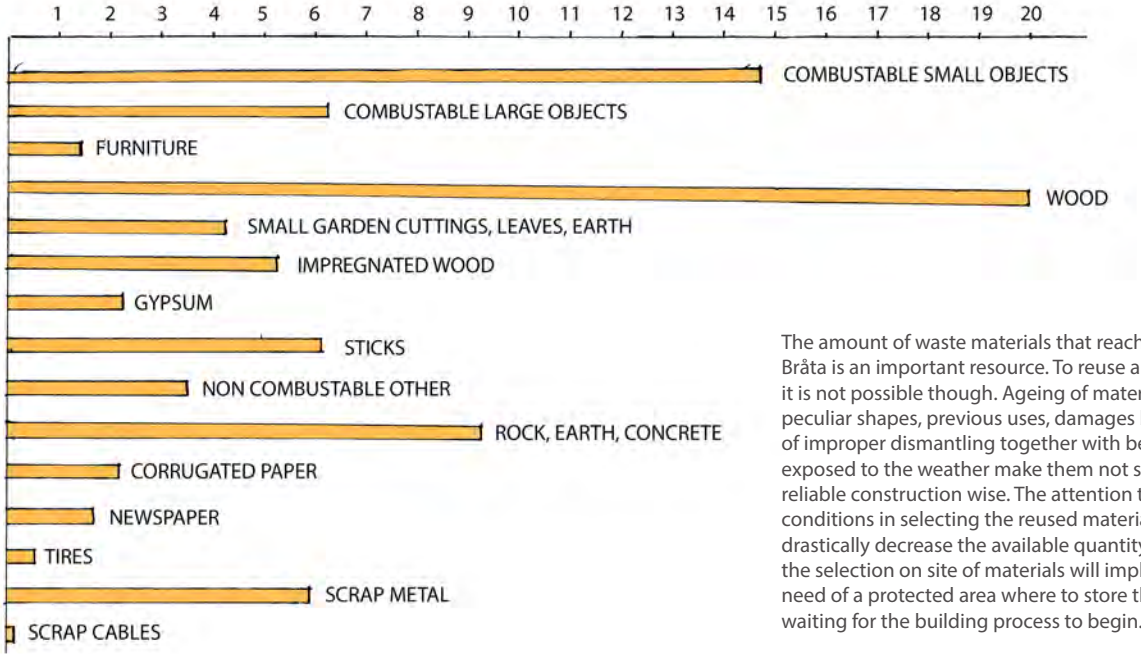
CURRENT SITUATION

AVAILABILITY AND USEFULNESS

Bråta is less visited between December and March resulting in less materials available for construction during this period. The weather is an influential factor in both the desire to be at Bråta as well as the undertaking of home renovation projects. Wood availability particularly declines during the winter months.



Amounts transported from Bråta January - December
Group 1: What a Waste



The amount of waste materials that reaches Bråta is an important resource. To reuse all of it is not possible though. Ageing of materials, peculiar shapes, previous uses, damages because of improper dismantling together with being exposed to the weather make them not so reliable construction wise. The attention to the conditions in selecting the reused material will drastically decrease the available quantity. Also the selection on site of materials will imply the need of a protected area where to store them waiting for the building process to begin.

	Foundation	Facade	Furniture	Insulation	Vertical structure	Horisontal structure	Indoor skin	Flooring	Exterior roof	Transperent surfaces
Tires	✓	✓	✓		✓				✓	
Impregnated wood		✓	✓		✓	✓		✓	✓	
Wood		✓	✓		✓	✓	✓	✓		
Corrugated cardboard			✓	✓			✓			
Metal		✓	✓						✓	
Tiles, Bricks, Stone, Concrete	✓	✓			✓		✓	✓		
Gypsum board							✓			
Glass		✓							✓	✓
Plastics		✓								✓
Mineral wool				✓						
Sticks, Straw		✓	✓	✓					✓	
Soil, Earth	✓	✓			✓		✓	✓		

In this scheme it is shown the possible uses of the materials coming to Bråta. Some materials are more versatile, some are quite difficult to use because of the shape or the complex transformation they have to go through before use.

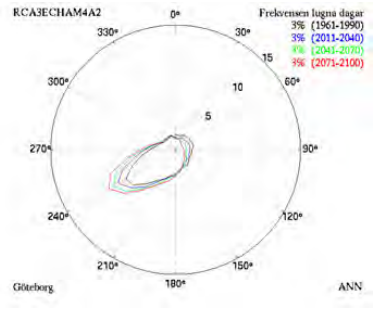
The red boxes are identified as the weak points for reused materials. The reason could be the scarcity of the specific material in a specific form or the performance quality. Reliability is important to have a durable and functioning building.

For the weak points, and other possible needs, materials could be gathered from Alelyckan. It's important to highlight that for the load bearing structure it can be difficult to use just reused materials especially for big spans, but the possibility of finding big structures to be rebuilt on site should be taken in consideration if available.

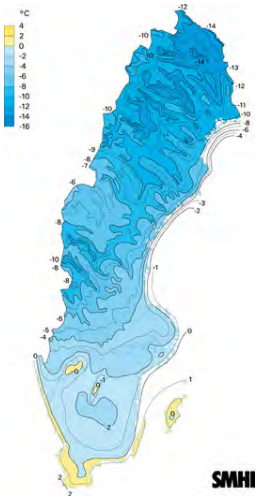
What and where materials can be used
Group 9: Bråta Recycling Centre

december

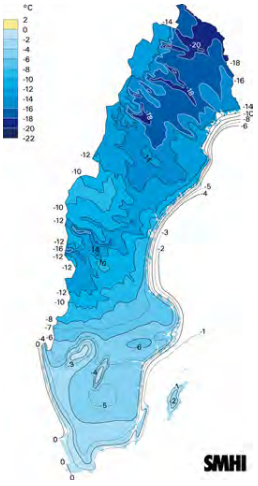
- Average temp. in December -1°C
- Minimum temp. in December -20°C
- Wind speed 6 m/s, from west
- Wind power 50-100W/m2
- Relative humidity 75-80%
- Highest point of the sun 8.88 °
- 6h33 of daylight



Wind direction December



Average temp. December

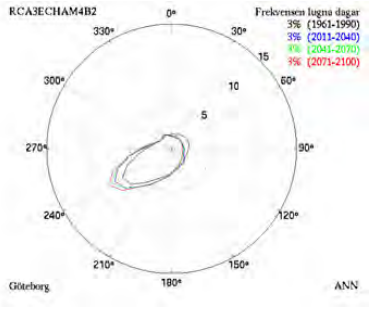


Coldest average temp. December

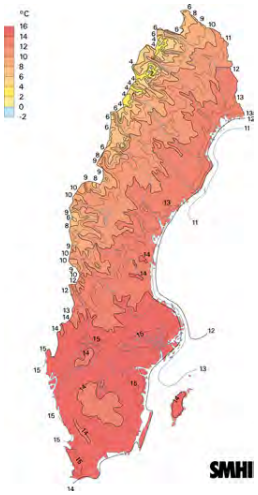
Solar radiation December

june

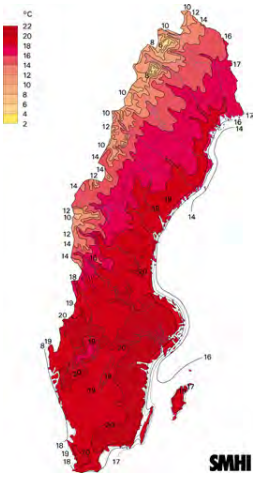
- Average temp. in June 15°C
- Maximum temp. in June 34°C
- Wind speed 3.5 m/s, from west
- Wind power 150-250 W/m2
- Relative humidity 80-85%
- Highest point of the sun 55.75°
- 18h05 of daylight



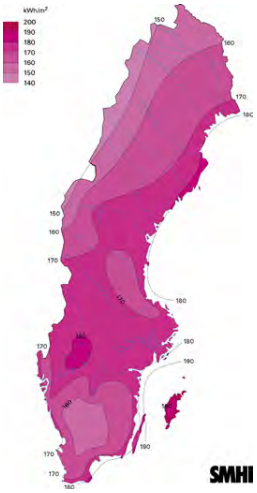
Wind direction June



Average temp. June

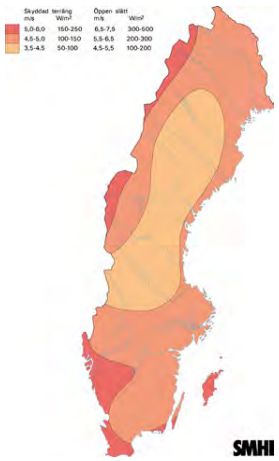


Warmest average temp. June

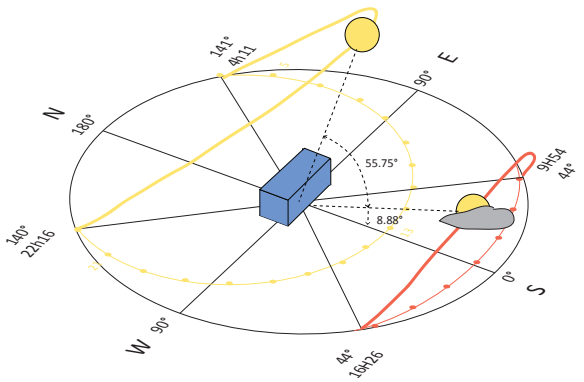


Solar radiation June

Year percipitation 1000 mm



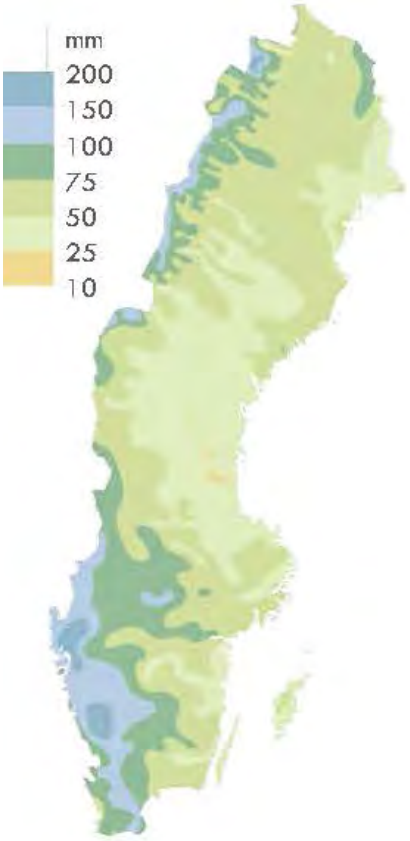
Average wind speed



Solar angle longest and shortest path

Group 1 :What a Waste

CURRENT SITUATION



Group 7 : Bråta: Product and Resource Park

precipitation in gothenburg 2013 : 809mm / year
average precipitation 1961-1990 : 758mm / year

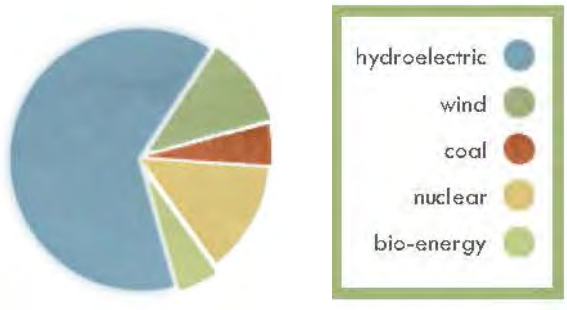
170 days of precipitation / year

1 mm of rain is equivalent to 1 liter per square meter.
7 500 x 758 = 5 685 000 liter / year
($A_{bråta}$ x average precipitation = liter rain at site / year)

left: amount of precipation during october 2013.
(smhi, 2013)

Bråta water consumption: 37 m^3
(Hagman, 2014)

Energy management system today
Group 7 : Bråta: Product and Resource Park



Sources of electricity production in Sweden today
Group 7 : Bråta: Product and Resource Park

ENERGY CONSUMPTION

Bråta currently consumes around 40 - 50 000 kWh/year. This is mainly to operate the electric fence and the street-lights, but electricity is also needed for heating and ventilation (Group 5, 7 2014).

The energy at Bråta comes from Härryda Energi, which only delivers energy from 100% renewable resources, which in this case is hydroelectric power (Group 5, 7 2014).

Energy consumption could be reduced for example by using LED lights for the street lamps: about 6 000kWh could be saved each year (representing 8 500 SEK and a potential reduction of GHG emissions due to street lightning by 70%) (Group 8, 2014).

The fence is the highest source of energy consumption on site. Students have suggested how to reassess the need for an electric fence in their analysis and design strategies.

CURRENT SITUATION

Bråta from *Wendelsbergs friluftsområde*

Entrance

One of the lakes nearby

'Broadway' (the ramp)

Unused containers and parking by office building

Hazardous waste building (right)
Emmaus picking up items from reuse donation centre (behind truck)

Images of context and site
Groups 2, 4, 8, 9, 10

CURRENT SITUATION

Entry access card reader


View of Bråta from the round-a-bout

A truck and container


Packaging recycle containers


Large combustible container

The three containers for donating reusable items

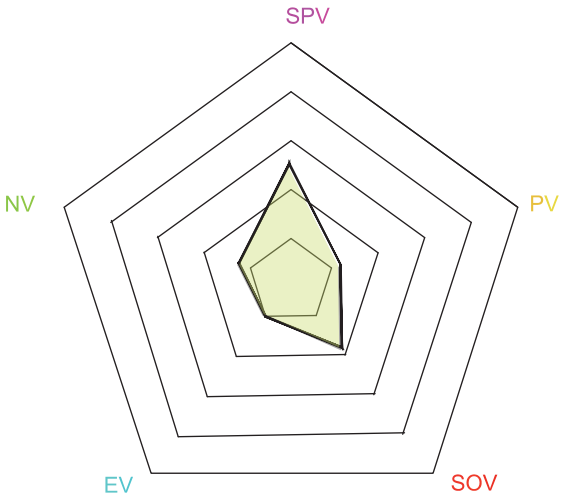

Disorder is a common problem in reuse containers

Group 2: Bråta Recycling Centre

URBAN SPACE VALUE ANALYSIS

A SUSIE analysis is one way to measure the ability for a place to invoke a sense of place in the mind of a visitor. The *Bråtapaviljong* design group could use a similar analysis to evaluate their final proposal (also being critical of group 5's initial assessment).

The chart and diagram on this page shows the results of a "SUSIE" analysis conducted by group 5. They concluded that the perceptual, nodal and environmental values are the weakest values present at Bråta.



SUSIE Analysis of Bråta Recycling Centre
Group 5: Bråta

System for urban space information and evaluation (SUSIE)

NODAL VALUE	A. accessibility	✓	✓			
	B. connectivity	✓				
	C. mobility means	✓				
	D. adjacencies	✓	✓			
	E. public transport	✓				
SPATIAL VALUE	A. legibility	✓	✓			
	B. permeability	✓	✓	✓		
	C. visibility（in&out）	✓	✓	✓	✓	
	D. spatial density	✓				
	E. intensity(activities)	✓				
PERCEPTUAL VALVUE	A. identity	✓				
	B. sociability/community	✓				
	C.cultural-historical associate	✓				
	D. focused-character	✓	✓			
	E. safety/security	✓				
SOCIAL VALUE	A. diversity	✓				
	B. amenities	✓				
	C. interactivity	✓	✓			
	D. privacy	✓	✓	✓		
	E. choice	✓	✓			
ENVIRONMENTAL VALUE	A. greenery					
	B. shade& sunlight	✓	✓			
	C. ecology	✓				
	D. comfort	✓				
	E. water	✓				

SWOT-ANALYSIS

A SWOT-analysis identifies the Strengths, Weaknesses, Opportunities and Threats of a site to consider when planning for development. It is an effective way to summarize the essential qualities of the situation that the design will be placed in. The SWOT analysis to the right is a composite of all of the Strengths, Weaknesses, Opportunities and Threats that the students have identified at Bråta.

CURRENT SITUATION

STRENGTHS

- 85% of waste is diverted from the landfill
- Positive attitude of employees
- Opening hours
- Many visitors (100 000 visits per year)
- Energy from renewable sources
- Space to donate to charities
- Existing buildings are in good condition
- No major problems or complaints from workers and visitors
- Overall well functioning basic daily activities
- Spontaneous social interaction occurs often on the ramp ('broadway')
- Highly rated customer service
- Nearness to community

WEAKNESSES

- Most waste is incinerated
- Too little is going to reuse
- Asphalt covers entire site
- Harsh and grey appearance
- Surrounded by electric fence
- Often one car per customer
- Reuse area is not very visible
- Reuse items often end up in a disorder
- Car dependency
- Inefficient site use
- Small site
- Visually uninviting
- Difficult to use if you do not own a car
- Accessibility for people without cars
- Impersonal, hard surfaces
- No relation to surroundings
- No rain protection
- Isolated reuse hall
- Weak link to surroundings
- No sustainable technology on site
- Traffic jams
- No information about the connection and impact on the global waste problem

OPPORTUNITIES

- Ideal place for offering education and information about the social, urban and environmental problem of waste and resource management
- Could be a leader in developing ways to meet EU 2020 goals to reduce waste going to incineration
- Nearness to Göteborg (opportunity to serve as an example for them)
- Part of a large network of organizations in charge of addressing the waste problem
- Could expand and support the social meeting aspect of the activities on site
- With some rearrangement, there is more space on site than first apparent
- The parks nearby offer an opportunity to connect appreciation of nature with reducing our impact on it
- A source of materials
- A good place to disseminate knowledge and opportunities for repair, disassembly and exchange
- A good place to discuss and support concepts of circular economy

THREATS

- Increasing amount of waste in society
- No more landfills are being built
- Budget to redesign the system to meet 2020 goals
- Fixed and rigid area with strong boarders makes major changes difficult
- Added functions on site could add traffic and parking problems
- Pollutants in water run-off bad for neighbours and nature
- Thieves

CONCLUDING THOUGHTS TOWARDS DESIGN

(In the following text *ÅVC* stands for the Swedish name for Recycling Centres , *Återvinningscentral*)

The future role of ÅVCs is a social, architectural, technical and environmental problem.
- ¤ What role can creative design and planning play in the evolution of ÅVCs?

Waste is mostly incinerated when much of it could be reused or recycled.
- ¤ Support for sorting out reusable and recyclable items is needed
- ¤ Feedback to visitors on how their actions make a difference is needed
- ¤ Information, education, inspiration and promotion is needed
  - * Design of facilities, functions and signage
  - * Staff dedicated to informing, educating and promoting
    - How does the design and layout of the place facilitate this work?

The ÅVC is an impersonal and uninspiring environment.
- ¤ Can one change it to an inspiring and pleasant place?
- ¤ Can one shift it from a peripheral position to a central one?
  - * Physically making satellite ÅVC functions closer to housing
  - * Psychologically making ÅVCs a more self-evident part and central part of the urban system and landscape (without physically changing its location).

The ÅVC is currently an informal community meeting point.
- ¤ How can one build on this and use it to promote better resource practices in society?
- ¤ Social interaction on the ramp can be a problem for traffic flow
  - * Can it be encouraged to occur elsewhere on site?
- ¤ A very active and highly visited place in the community
  - * How does one manage an increase in visitors?

Problem of accessibility.
- ¤ Car dependent functions
  - * How does one provide access for those without a car?
  - * Peripheral location
    - Waste/Resource management exists at the periphery of our minds, communities and habits. How do we make it central?

Who is the visitor and what are their needs?
- ¤ If Bråta was to truly serve the whole community it should consider the needs of:
  - * car owners versus non-car owners
  - * house versus apartment dwellers
  - * intergenerational
  - * multicultural
  - * gender
  - * abilities vs. disabilities

Weak link to surroundings.
- ¤ Isolated boarders and strong disconnection with surroundings
  - * Rethink functional and physical relationships between ÅVCs and context
  - * Can one divide the site into functions that are more accessible to the public and others that are not?
  - * Can one rethink the fence around the area? Are there other ways to provide a secure boarder?

Waste/Resource management is something we try to hide and forget

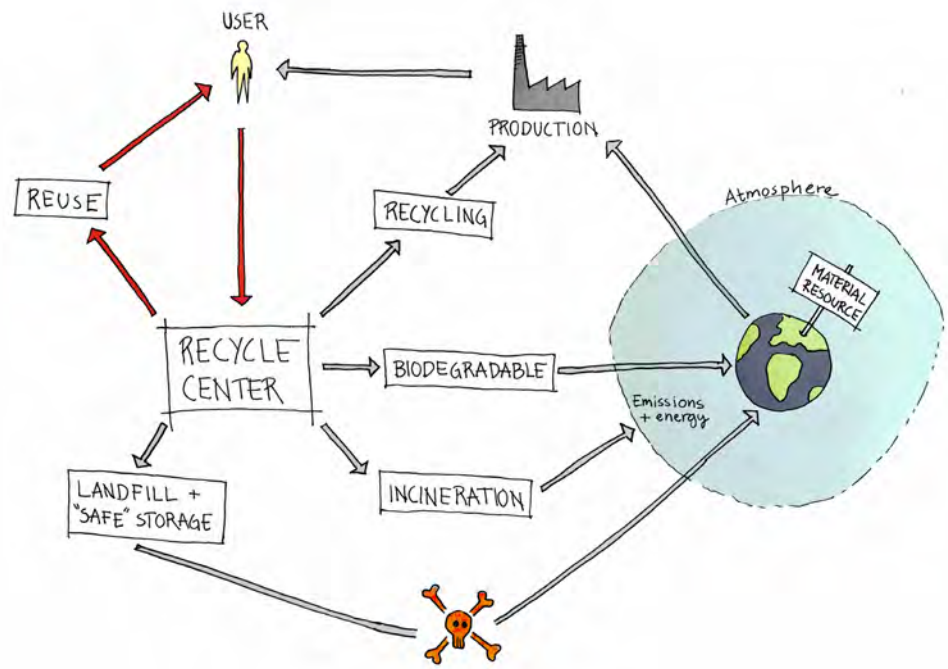
- ¤ How do we shift the attitudes about reuse, recycling and resource use?

Rainwater run-off from the site is contaminated.

- ¤ From open containers
- ¤ From pavement and cars

There are no sustainable technologies on site.

- ¤ Energy and material use at an ÅVC should reflect the principles of resource conservation and regeneration in their own buildings and functions



AFFECTING THE GLOBAL FLOW OF RESOURCES LOCALLY

"In a cradle to cradle approach the waste should be biodegradable or recyclable to reduce the impact on the environment. This approach means "closed loops" and a zero waste community. All the waste feeds another activity, either the nature or the industry. Unfortunately this isn't reality yet, still waste are landfilled of transformed into emissions in the atmosphere by incineration.

With this in consideration the reuse of products becomes very important. When reusing "waste" we decreases the amount of waste and emissions. We decreases the need of new products and extending the products life cycle. Hence, the focus in this project is reuse (the red arrows in the diagram above. The is also due to the fact that this is a part of the waste management that Bråta can affect a lot." (quote from Group 5)

WHAT IS A RECYCLE CENTRE IN THE FUTURE?

A recycle centre must be seen as a resource centre.

- – a place where materials and resources are available, like a market place.
- – a place where information and opportunities to change one's personal resource use is found.
- – a place where one understands the full potential of materials and resources and understands how these can be converted into more useful forms at home, at Bråta or elsewhere.

KEY FEATURES OF PROPOSALS FROM STUDENTS:

Connect ÅVCs functionally and physically to surroundings

* Housing and businesses
* Park areas and physical landscape
* Rethink the boarders
* Support biodiversity
* Support community activity

Re-conceptualize waste and ÅVCs as public space and a hub for activities

* Make ÅVCs 'eco-parks'
* Make ÅVCs and reuse/recycling pleasant, fun, rewarding and inspiring
* Make ÅVCs a centre for a range of activities for a range of users
* Make ÅVCs a functional and/or visual landmark in the community
* Make and express ÅVCs as the heart of the material cycle in society

Make stronger connections to business and work opportunities

* Jobs and job training on site
* Training for better practices in demolition and construction in the community
* Promote companies that take back their own waste or have a responsible waste policy
* Become an internationally admired leader in recycling and reuse community centres and educate foreign administrators and professionals about how we did it
* Be a centre for the creation of art and products from waste
* Be a centre for trade and the purchasing of used items

Become a centre for education and information

* Information about the impact of reuse and recycling
* Information about EU and Swedish environmental and waste management goals
* Provide a virtual platform for recycling and reuse and for the ÅVC itself
* Use design of site, buildings and signage to communicate material cycles, the reuse stair and waste ladder, and other sustainable principles
* Provide educational events and activities
* Promote and reward reuse and recycling

User profile and needs

* Improve Accessibility for non-car owners
* Think of the intergenerational, multicultural and gender roles of users

Make the place flexible and implement changes over time

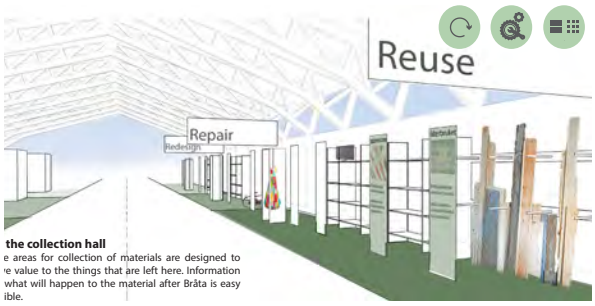
* Implement new paradigms step by step
* Consider seasonal, and day versus night time activities
* Separate areas with high and low security needs to open up for other uses

Make ÅVCs examples of how to build sustainability using regenerative design principles

* Use reused, reusable and non-toxic construction materials
* Integrate renewable energy
* Build according to biological and technical cradle to cradle cycles

ESSENTIAL CONSIDERATIONS FOR THE DESIGN

The following section includes extracted material from the students' work. The considerations presented in this chapter are essential for development of the programme and the design of Bråtapaviljongen. This does not mean they must be included in the design, but are rather issues that are particularly applicable and/or important. It is therefore essential to have a clear standing on how these will be addressed before design commences.



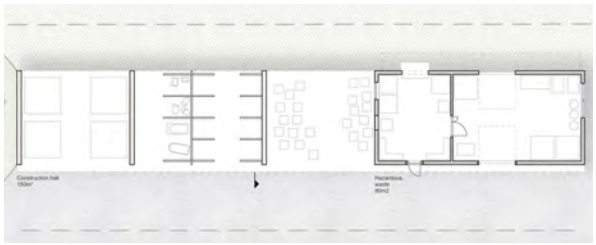
Pragmatic and spacious hall with good sorting system.
Accessible by car.
Group 6: Bråta Resource Park

SORTING SPACE

Space where the visitors can sort their goods on site. Can be connected to the reuse space or can be a separate space. The visitors must know where their material goes and therefore simple and clear signage is important.

The sorting space could either be a hall that cars drive through or a building they park next to and enter by foot.

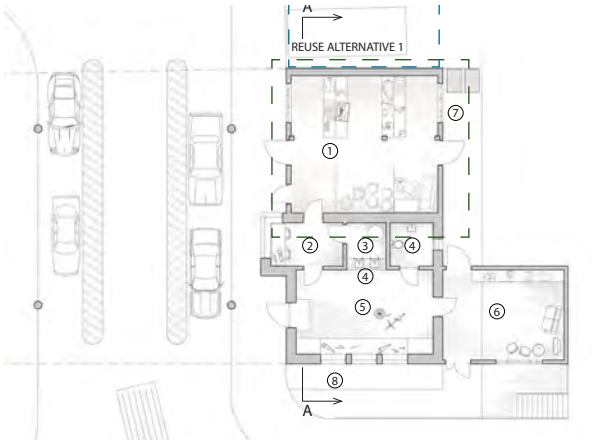
Materials to be sorted:
- Construction material
- Clothes
- Furniture
- Household objects



Simple reuse hall in the south of the recycle centre Both exterior and interior spaces
Easy accessible and rather spacious
Group 10: The Island

All items need to be protected from rain, with the exception of some construction materials, such as bricks, pavers, roof shingles, etcetera. Clothes and cloth furniture need to be protected from humidity. Paints, glues and other liquids need to be protected from freezing and overheating.

Household items may need to be locked when Bråta is closed. Most construction materials don't need to be locked, however some smaller items may need to be.



Reuse hall (1) with easy drop- off and connected to small office for a worker to be able to greet customers and help them sort material (2), loading dock (7) as well as rooms for dissasembly repair (5) and items one can take home(6)
Group 9: Bråta Recycling Centre

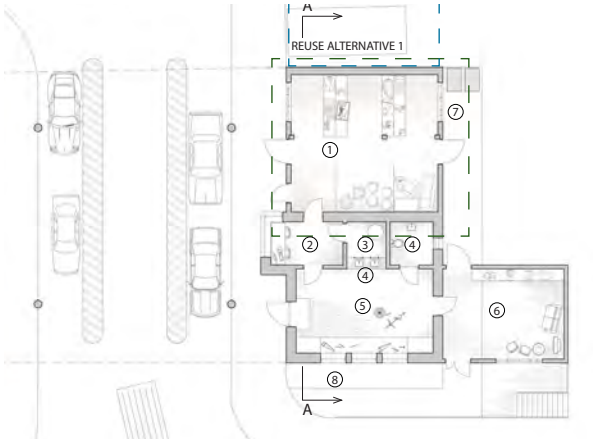
REUSE SPACE / SWOP SHOP

Space where building materials and other reusable goods are collected to be reused or taken home by someone. This space must be considered being both interior and exterior, depending on the need of the materials. Logistics, size, accessibility and heated / non heated areas must be considered.

DISASSEMBLY AREA

Several student projects suggest a disassembly area. Customers could disassemble composite items here to help in a more effective separation of materials. This area would then include tools and a work bench and sorting bins.

FUNCTIONS



Technical room at center of the building (3) with a glass wall that makes the technology visible to visitors
Group 9: Bråta Recycling Centre

TECHNICAL ROOM

A space where the technology of the pavilion is collected. The question must be raised what kind of technology is needed in the pavilion and how much space it will take. The technology could be visible for learning and understanding.

STORAGE SPACE & STAFF ROOM

Space to store things needed for workshop and for everyday work in the pavilion. This space can be combined with a smaller office for the person/ persons working in the pavilion. The office space in the pavilion is to enable the connection between visitor and municipality.

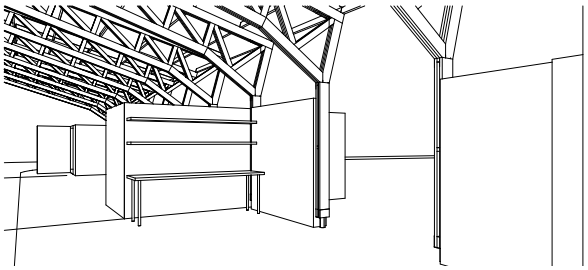
WASHING STATION & SPIGOT

It could be good to have a place to wash your hands after sorting or working. Workshops could need a water source. Café activities will need to be able to wash dishes and have access to water for cleaning in general. An outdoor spigot for connecting a hose or using to fill buckets for washing floors and equipment could also be useful.

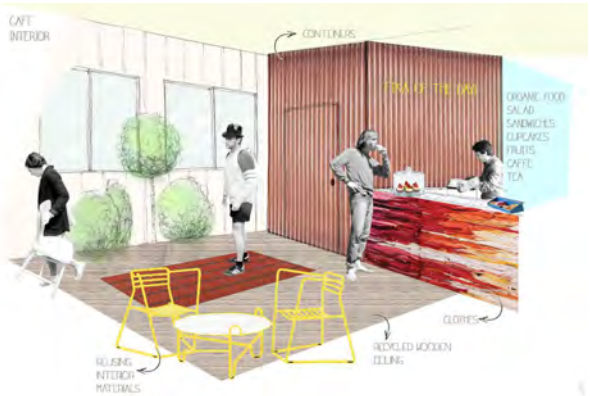
PUBLIC TOILET

If there are to be places where people stay for a while a public toilet can be needed. A seperation toilet could be used to explain their role in resource cycles and regenerative design.

Inspirational objects exhibited in the pavilion
Group 3: Bråta – The Platform



Simple space provided for possible workshops
Group 6: Bråta Resource Park



Reused material as inspiration in the café
Group 3: Bråta – The Platform

FLEXIBLE / MULTI-PURPOSES SPACE

Other functions serving the overall vision of the building have been identified by students. Because all these activities cannot be given individual spaces (within the budget and size limitations), a flexible space enabling different activities at different times of the week / year is an alternative solution. These functions are:

Exhibition
The pavilion aims to be informative and inspirational, therefore it is important to show the visitors what can be done with reused materials. An exhibition space does not have to be large, and can be integrated in the façade for example.

Workshop
A space for the visitors to work with their hands. It can be the place for do-it-yourself (D.I.Y.) practical courses (small objects, bike repairing, house renovations). The workshop should be a flexible space that can transform and be used during workshops, rather than being a classical workshop.

Café
The classic meeting point for socialization in order for Bråta to be more than just a recycle centre. Many students proposed real cafés managed by an external organization, but it can simply consists of a automatic coffee machine and some furniture.

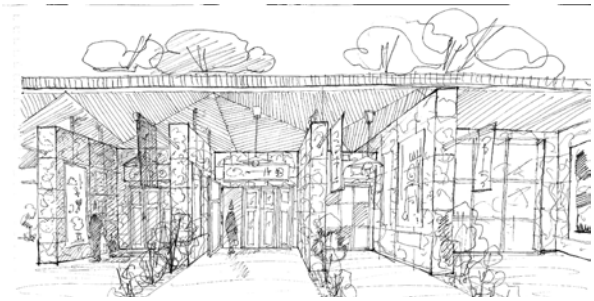
Information Centre
An area to spread information to visitors is important. Types of information that could be here:
- the waste system and problem
- the pavilion construction and process
- guidelines for construction and demolition methods which support reuse
- Bråta
- upcoming events

SPATIAL QUALITIES

A well situated building, welcoming, reminiscent of an office or gallery typology, and easily communicates that there is more to Bråta then the sorting of materials.
Group 7: Bråta Product and Resource Park

SENSE OF PLACE

The spatial qualities of the building should support the a meaningful experience for the user. The sense of place is the synthesis of the building experience as a whole and is made up of many aspects such as: size, enclosure, form, function, texture, color, materiality, light quialities, the experience of approaching and arriving at the building, how well it fits into its surroundings, references to other personal and cultural experiences a person might have of buildings, etcetera.



An entrance that creates an enclosure and explains how the building functions to ensure better sorting and reduce the potential frustration of confusion over where to go..
Group 5: Bråta

WELCOMING AND UNDERSTANDABLE ENTRANCE

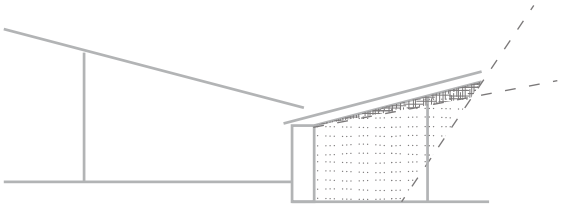
Bråta must have a welcoming entrance to invite people to visit the building, to arouse curiosity, and to help users finding their way to the pavilion. The entrance should also communicate the functions within the building, facilitate the sorting of materials and communicate that there is more to Bråta and this building then the sorting of materials.

Design proposal with old windows facade
Group 6: Bråta Resource Park

INSPIRATIONAL USE OF MATERIALS

In order to find the building and attract visitors, and inspire people to incorporate the idea of re-use into their own projects, the pavilion must be especially eye-catching and inspirational.

Inspiration from façades made of re-used materials
Group 4: The tree



Scheme of solar angles (winter and summer), using the sun to heat the building and let enough light in
Group 1: What a waste

SHADOW AND LIGHT

The design of the building must take shadow and light in consideration to create a good atmosphere.

SITE PLANNING

Roof between hazardous waste and reuse buildings
Group 9: Bråta Recycling Centre

A SENSE OF ENTRY

A welcoming entrance to the site improves the experience of visiting the reuse centre, and can help visitors to find their way to the pavilion. This can be achieved both through the placement and the form of the building as well as through landscaping the entry to the site.

Group 4: The Tree

INCLUDING ECOSYSTEM SERVICES

To become a welcoming site for inspiration, Bråta must change its image of being a dead place covered in asphalt and concrete. Addition of vegetation should be realistic, and can have many benefits:

- Planters and trees can be a simple way of creating a welcoming entry and a pleasant experience
- The pavilion could have a green roof to prolong the roof's life and increase biodiversity

Group 3: Bråta – The Platform

OUTDOOR EXHIBITION

Displaying reuse ideas can be located around the site, not just on and in the pavilion. A sculpture at the round-a-bout, bird houses of waste made by children in the forest, or other places on the site could serve as places to display creative uses of waste.

Exterior space for learning
Group 1: What a waste

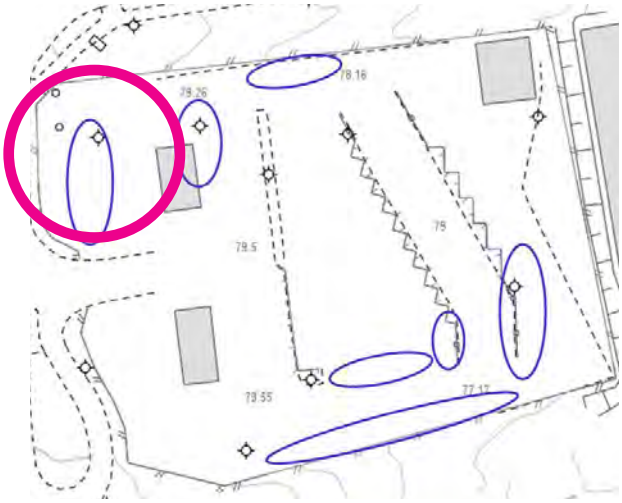
PARKING AND PEDESTRIAN NEEDS

Parking is a very important question in this project, as there isn't any parking today for visitors on site. The suggested functions within programme imply the need for parking in order to fully experience the building and activities there. How much parking is needed will depend on the final decision of which function to include in the building.

The placement of the building must also take into consideration a safe route for pedestrians that have parked their car to reach the building.

However, activities conducted after opening hours of Bråta may not have a parking problem, as the entire site can then be used as a parking area when the trucks are not being driven around.

SITE PLANNING



Areas identified by Johan Hagman with the NW corner identified as a strategic site.

BUILDING PLACEMENT: NORTH-WEST CORNER

Many proposals use the NW corner of the site.

Common reasons this site is chosen:

+ Visible from round-about/intersection
+ Affects the first impression of Bråta
+ Near staff office building
+ One of the larger areas identified by Bråta
+ One of the areas least used at Bråta
+ Near the existing entry
+ Close to the bike path
+ Easy to make accessible at different hours
+ A good area for the social functions
+/- Likely alteration of electrical fence
- Not a good area for dropping off material
- Traffic problems

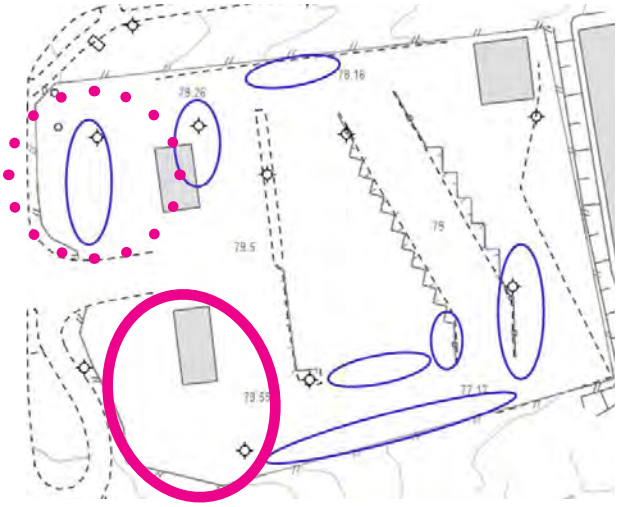
Group 3: Bråta, The Platform

EXAMPLE: CREATING A COURTYARD

(Building placement: NW corner)

Additional features of this layout:

+ Creates intimate courtyard for activities
+ Various buildings for various functions allows for it to be built in phases and adjust to different needs
+/- Requires alteration of fence
- Buildings mostly face courtyard making it feel a bit separate and closed from the rest of the site and is potentially a less inviting entry into the site as a whole.
- Energy consumption to heat each building would be higher as they have a larger exterior wall surface to interior space
- Requires change of vehicle entry to create a generous courtyard.
- Design for drop-off and parking could be developed further
- Building sizes are small



Areas identified by Johan Hagman with the SW corner identified as a strategic site.

BUILDING PLACEMENT: SOUTH-WEST CORNER

Many proposals also use the SW corner with the argument that the appliance storage is inefficient and could be repositioned on site.

Common reasons the SW corner is chosen:

+ Provides more m2 of building area
+ Placing the reuse collection near the hazardous material collection makes management of these two functions easier for workers
+ It is one of the first things you encounter on 'the loop'
- Could make access to the back of the hazardous waste building difficult

Group 5: Bråta

EXAMPLE: FACING EXISTING BUILDINGS

(Building placement: NW and SW corner)

Additional features of this layout:

+ An intimate and dynamic courtyard is created with the office building
+ Social and creative functions near office
+ Reuse collection and hazardous materials collection are spatially related to one another
+ Drop-off and parking needs accounted for
+ Does not require re-routing traffic
+/- Requires alteration of fence
- Does not allow for re-routing of traffic
- The reuse building does not necessarily help to emphasize a welcoming entry
- Space in front of the reuse building may be a bit small for manoeuvring vehicles
- Does not provide an adequate solution to appliance relocation

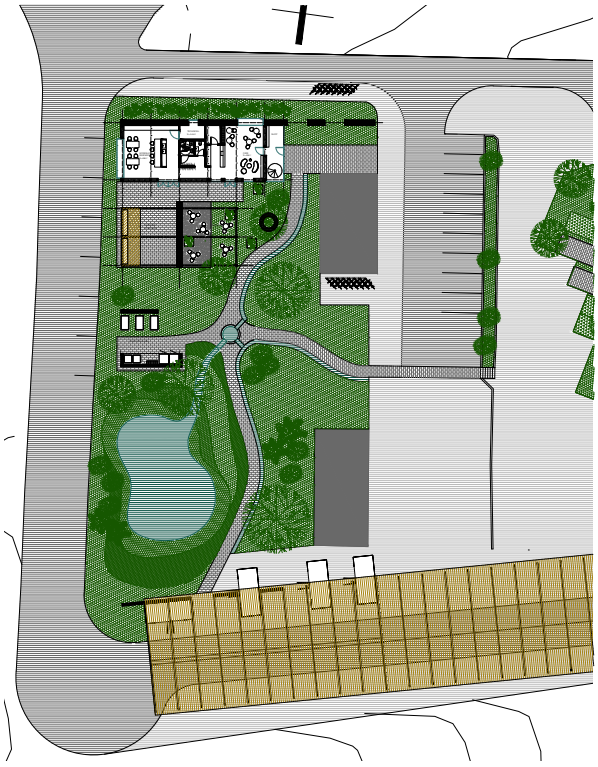
Group 7: Bråta Product & Resource Park

EXAMPLE: EXPANDING EXISTING BUILDINGS

(Building placement: NW and SW corner)

Additional features of this layout:

+ New image on both sides of the entry
+ Social and creative activities is well integrated with existing office building
+ Reuse collection is well integrated with the hazardous waste collection
+ Easily allows for separate management and opening hours from rest of Bråta.
+ Can be built in phases
+ Drop-off and parking needs accounted for
+ Effective appliance storage
+ Does not require re-routing traffic
+ Allows for re-routing of traffic
+ Green space feels like natural extension of surroundings
+/- Requires alteration of electrical fence
- Undefined exterior spaces



Group 6: Bråta Resource Park

EXAMPLE: GENEROUS GREEN SPACE AND AN INTIMATE COURTYARD

(Building placement: NW and SW corner)

Additional features of this layout:

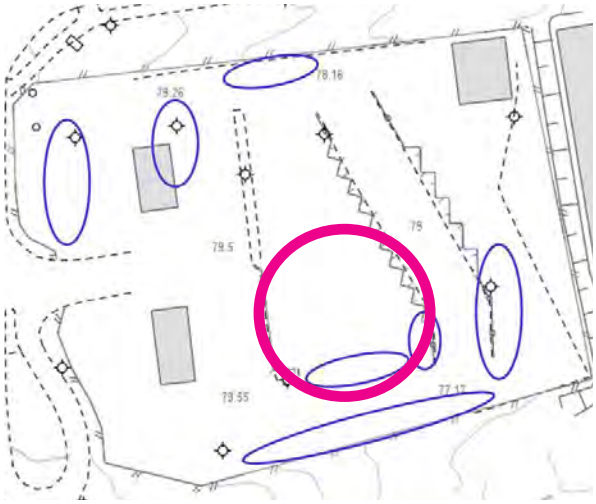
+ Social and creative activities is well integrated with existing office building
+ Intimate courtyard between social and creative functions and office building
+ Generous green space defines the entry
+ Large m2 for material storage and donation
+ Flexible and expandable space for material storage
+ Drop-off and parking needs accounted for
+ Building and intimate courtyard does not require re-routing traffic
+/- Requires alteration of fence
- Larger green space and reuse building requires re-routing of traffic
- Requires change of vehicle entry to create material storage and donation building
- Relation and access to the hazardous waste building is unclear

Group 2: Bråta Recycling centre

EXAMPLE:
HAZARDOUS BUILDING EXTENSION
(Building placement: SW corner)

Additional features of this layout:

+ Reuse collection is well integrated with the hazardous waste collection
+ Creates a courtyard
+ Does not require re-routing traffic
+/- Does not require an alteration of electrical fence
- Does not allow for re-routing of traffic
- Building is small
- Access to SW corner is made difficult
- Design for drop-off and parking could be developed further

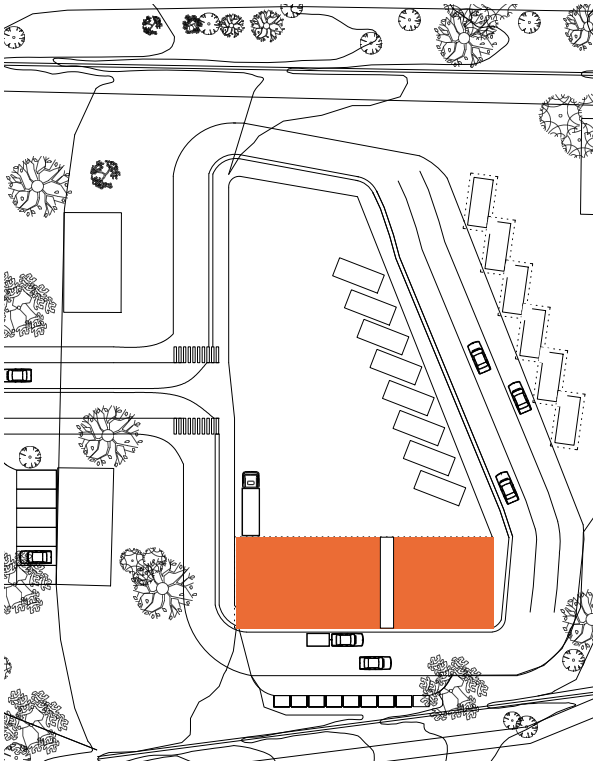


Areas identified by Johan Hagman with the centre identified as a strategic site.

BUILDING PLACEMENT: CENTRE

Common reasons this site is chosen:

+ Easy access from both sides of the building
+ The central location gives the building prominence on site
+ Truck access is the same as that to the containers
+ Pick-up is separated from drop-off areas
+ Works within the current logistics
+ Does not require re-routing traffic
+ Allows for re-routing of traffic
+/- Does not require alteration of fence
- Does not alter the first impression of Bråta
- Not visible from the intersection



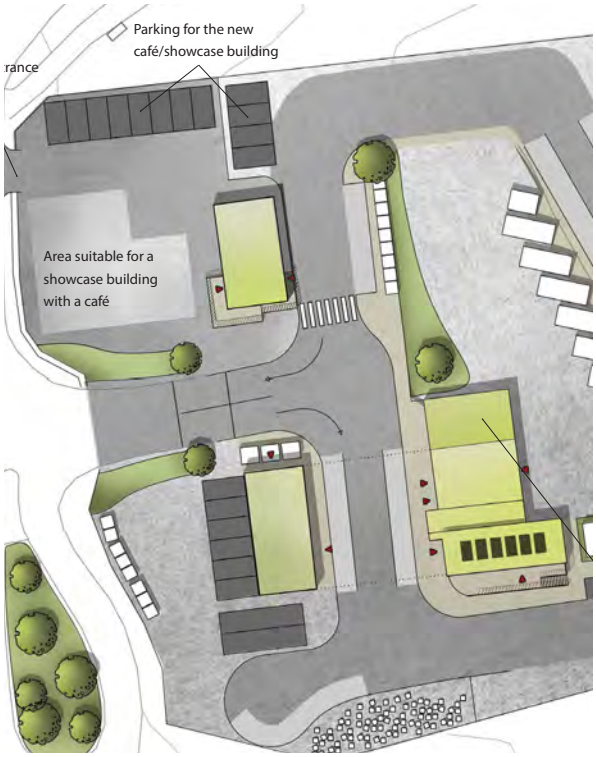
Group 8 : Simply a Roof

EXAMPLE: ALONG THE PATH

(Building placement: Centre)

Additional features of this layout:

+ Good relation to other recycling containers
+ Drop-off and parking needs accounted for
+ Large amount of m2
+ Can be built in phases



Group 9: Bråta Recycling Centre

EXAMPLE: AN ENTRY BETWEEN BUILDINGS

(Building placement: NW corner and Centre)

Additional features of this layout:

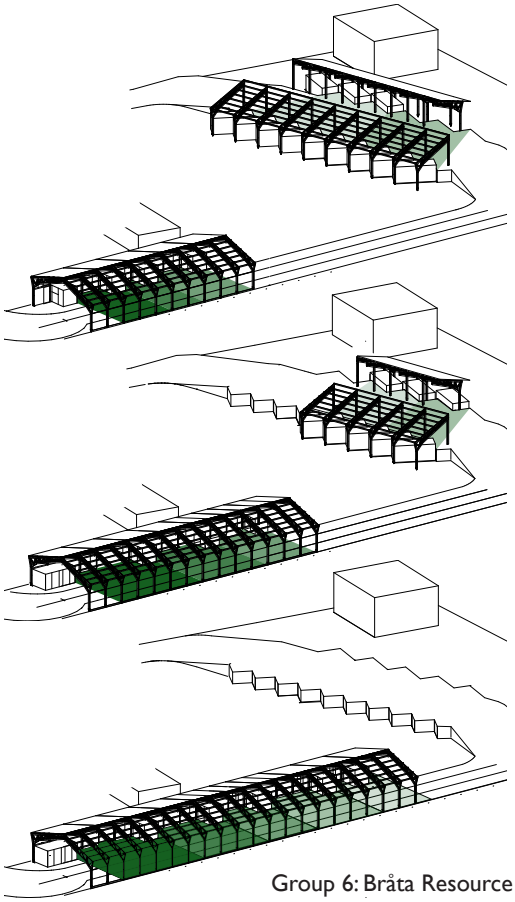
+ Allows for joint management and oversight of hazardous material and reuse material
+ Roof marks the beginning of circuit, protects from rain
+ Allows for extension of the building
+ Allows for additional building or outdoor exhibition space at NW corner which can help to create a good first impression
+ Drop-off and parking needs accounted for
+ Addition of greenery does not require massive amounts of work and helps to mark the entry to the site
+ Can be built in phases

One big building surrounds the square
Group 5: Bråta

Square defined by small buildings
Group 3: Bråta – The Platform

A MEANINGFUL EXTERIOR SPACE

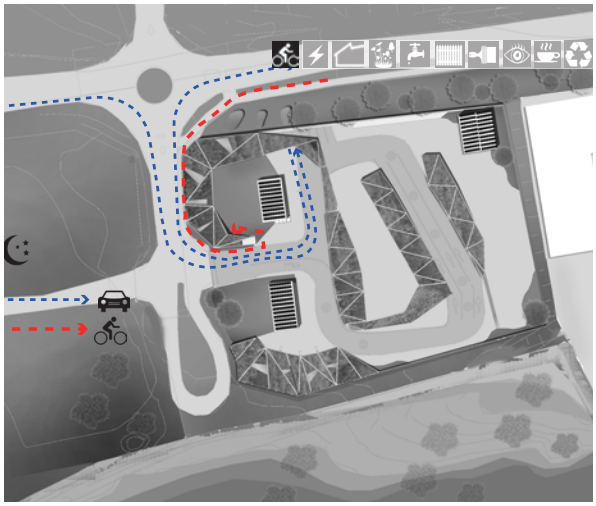
Creating an inviting exterior space with a distinct sens of place where activities can occur can make Bråta into more than just a place to sort materials and help visitors to have a meaningful and pleasant experience of the building.



Group 6: Bråta Resource Park

FLEXIBILITY FOR FUTURE CHANGES

Planning the building so that it can be moved could facilitate future changes to Bråta. It can increase initial costs, but save the centre money in the long run. The location of the building should consider possibilities for expansion and could be placed so as not to hinder future changes in logistics.



Night time access
Group 5: Bråta

AFTER HOURS ACCESS AND SEPARATE MANAGEMENT POSSIBILITIES

The building's placement could consider whether or not there will ever be a need to separate the building from the rest of Bråta in terms of opening hours or management.

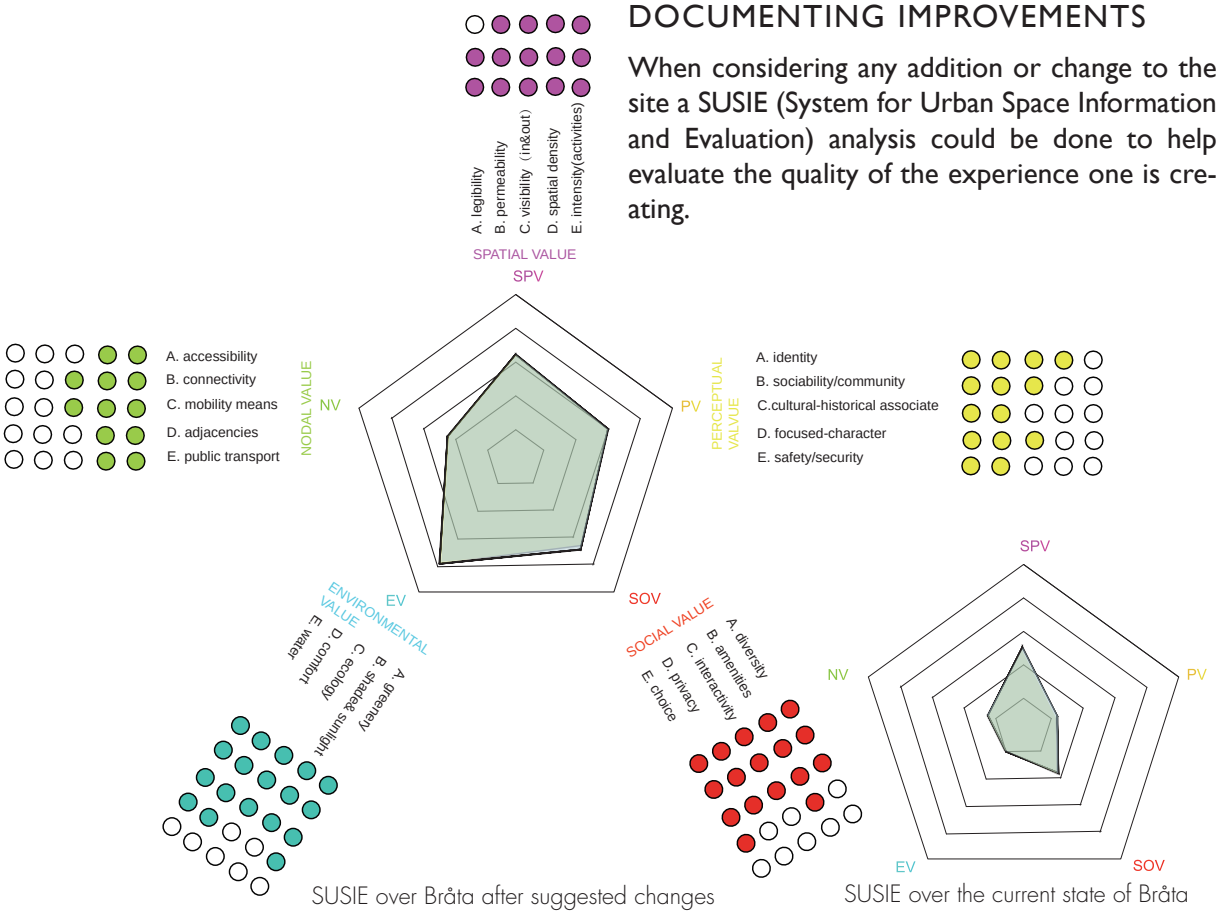
REMOVING OR MODIFYING FENCE

Many projects question the need for the electric fence as it is primarily the hazardous materials that needs to be locked up and the electric fence requires a lot of electricity.

The placement of the fence and the decision to provide night time access can require modifications to the fence.

DOCUMENTING IMPROVEMENTS

When considering any addition or change to the site a SUSIE (System for Urban Space Information and Evaluation) analysis could be done to help evaluate the quality of the experience one is creating.



SUSIE over Bråta after suggested changes

SUSIE over the current state of Bråta

Group 5: Bråta

USERS

COUPLES

Meeting place
Art
Flower shop
Workshops

KIDS

Playground
Education center

EXCHANGERS

Exchange market
Cherity
Second hand shop

TEENAGERS

Meeting place
Education center
Art
Mini skate park?

Different users and their possible interests on site
Group 5: Bråta

DIFFERENT USERS

What kind of users will visit the pavilion and what will their needs be? The pavilion must be accessible for everyone as it is a public building.

Plants should be seen as a user on any building site
Group 1: What a waste

PLANTS AND ANIMALS

Plants and animals should be seen as users on the site as well as human beings. Considerations on how to include conducive enviroments for enhancing biodiversity on site is essential in the design of the pavilion.

OUTREACH & INVOLVEMENT

A RECOGNIZABLE IDENTITY

Besides making a building which has a particular identity, a logo for Bråta as a whole can help to communicate that there is something special about Bråta (which the building is a part of) and that there is a vision and content which goes beyond the efficient sorting of materials.

Example of logo for a project
Group 4: The tree

CREATING A PRESENCE ON-LINE

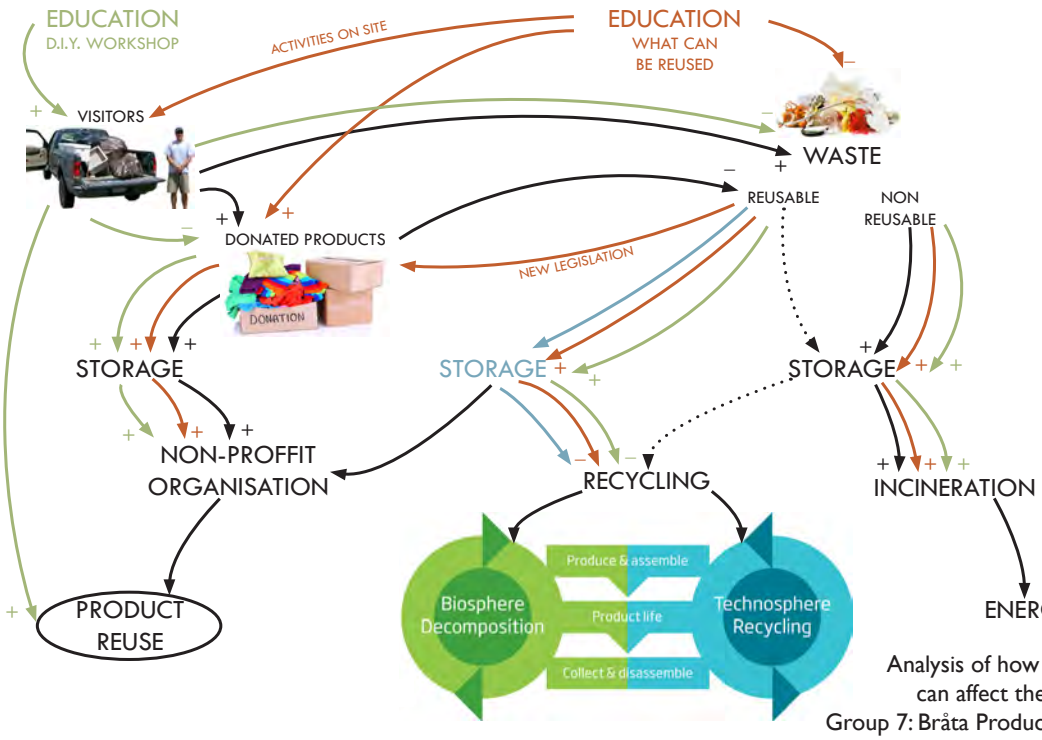
Creating a digital presence can help spread information and create interest within the community and beyond. This can help to increase participation in activities at Bråta, but it can also help other communities to understand what possibilities there are for recycling centres and the reuse of materials.

Signage can be used to spread knowledge
Group 7: Bråta Product & Resource Park

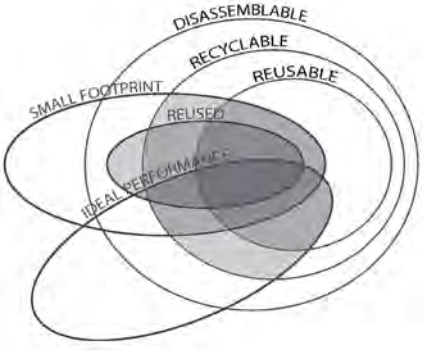
LEARNING AND DOING

There should be opportunities for passive or active involvement and learning on site. Visitors should be able to understand what their role is (and could be) in a system where waste is seen as a resource, EU goals, Bråta's goals, the local and global situation of resource management, etc.

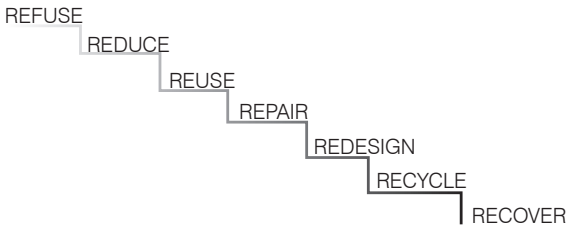
What are the consequences of their actions and where do things go? How can we avoid waste going to the incinerator? What process help to convert the 'waste' into a resource? What can be made out of the things we throw away?



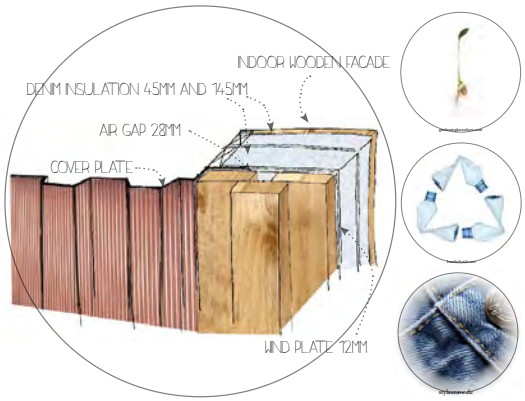
Analysis of how learning and doing can affect the flow of resources
Group 7: Bråta Product & Resource Park



Considerations for material selection
Group 9: Bråta recycling centre



The waste hierarchy
Group 6: Bråta Resource Park



Walls
Group 3: The Platform

ORIGIN OF MATERIALS

A core idea of the project is building out of reused materials, ideally coming from the site. However, some materials may come from other places, or may be new. Assessing the origin of materials is in this project important considering the initial goal. Priority should be given to reused materials, but other aspects should also further be assessed.

Priority strategy for choosing materials:

1: Reused products from Bråta
2: Reused products from other recycling centres
3: Locally produced products based on recycled materials
4: Non-locally produced products based on recycled materials
5: Locally produced products based on virgin materials
6: Non-locally produced products based on virgin materials.

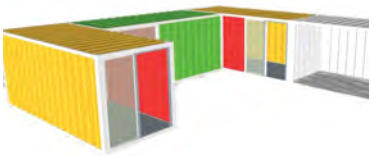
CONSCIOUS CHOICE OF NEW MATERIALS

When designing a sustainable building the choice of building materials is highly important. The pavilion at Bråta is however special since the purpose is to inspire the reuse of materials.

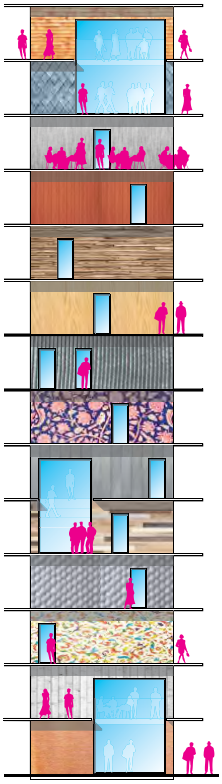
If there is a need to chose new materials, the choice of materials should follow a process, assessing different aspects. Things that can be taken into account are how they are produced, what they consist of and what will happen to them when they are no longer used in the intended building.

MATERIALS

Showing the qualities of different reused materials
Group 9: Bråta recycling centre



Containers as building material
Group 2: Bråta recycling centre



Facade as inspirational element
Group 4: The tree

AESTHETICS & QUALITY

With the aim that the pavilion should inspire others to reuse building materials or use "good" materials, the aesthetic of the pavilion and its materials must be appealing. A balance should be sought between showing off a variety of materials and having a holistic appearance.

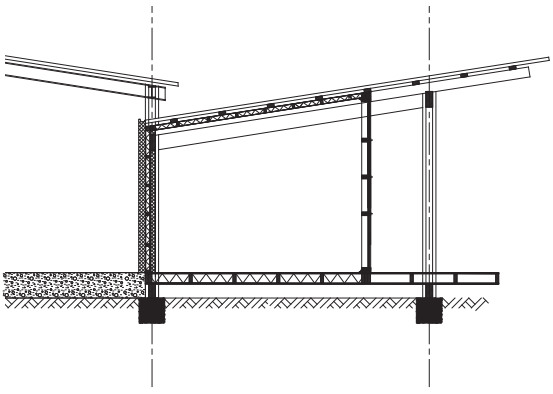
The quality of the materials affect how long the products will last in the pavilion and therefore the need for reparation. A product of high quality will also increase the chances of being reused once more in a new structure. But a product with low quality that needs to be exchanged or repaired often might still be interesting to use if the material is reused, or has a low environmental impact if new.

Example of design guidelines:

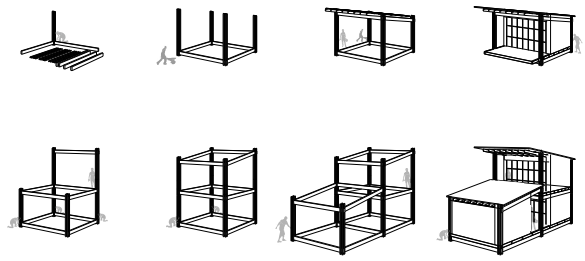
- The design must be developed to emphasize the inherent qualities of the reused materials.
- The design must strive to develop qualities beyond fashion and trends
- Be aware of cultural references and norms that can influence the use and experience of the building

DOCUMENTATION

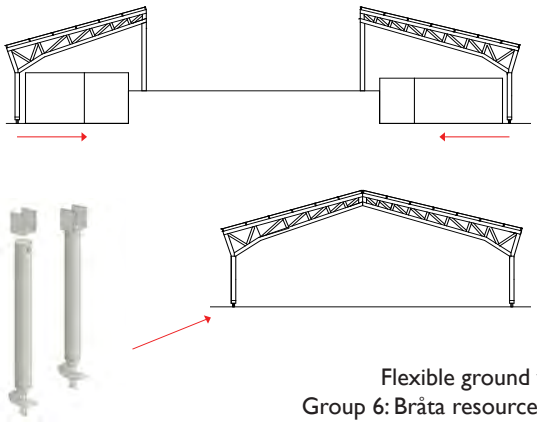
Documentation is important to ease future service and use of materials in the building. Documentation is also necessary to spread information about the project and materials used.



Importance to document e.g.. details and material choices in order to inform the visitors.
Group 1: What a waste



Extendable structure
Group 1: What a waste



Flexible ground work
Group 6: Bråta resource park

EVOLUTION AND DISMANTLING OF THE BUILDING

What happens to the building at the end of its operation time is an important consideration when talking about waste. The construction system of the building should take into account its dismantling. (Can materials be reused after being dismantled? Can the structure be mounted again, somewhere else?)

Likewise the construction system should allow evolution of functions overtime, so that the building is adaptable to new situations.

DEFINE NEEDS

Defining the needs of the building according to its functions is a strategy to save energy. Taking this into account at an early stage of the design is part of a "systems integrated" approach to the architectural design. It is important, as we want the building to be inspirational, to think about being environmentally and energetically responsible.

Heating: should the building be heated?

Ventilation: it has to be ventilated

Light: how much artificial light is needed and how much sunlight can be used in the building?

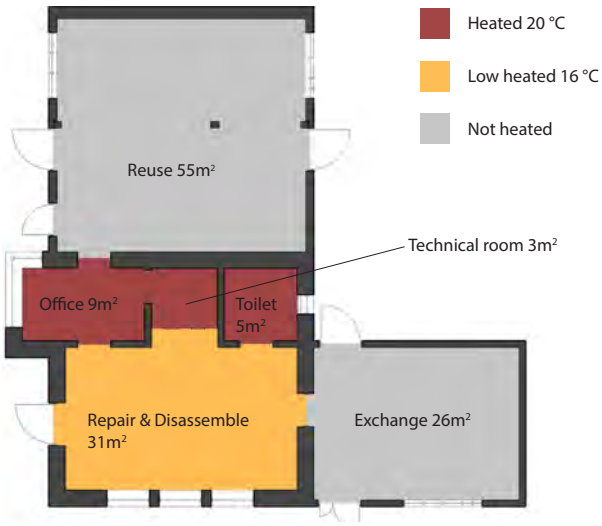
Electricity: what will electricity be needed for in the building?

DECIDE HOW TO MEET NEEDS

It is important to define an attitude toward building services and systems integration into the design.
- Is it an energy-efficient building?
- Is it a sustainable building?
- What criteria does the word sustainable cover?
- Is it a regenerative building?

Examples of attitudes adopted by students:

"SYSTEMS INTEGRATED DESIGN"
"SHAPED BY LOCAL CONDITIONS"
"CLOSING LOOPS"



Different levels of indoor comfort
Group 9: Bråta Recycling Centre

HEATED OR NON-HEATED SPACE

If we consider that the different activities hosted by the building don't all require a heated space, or that doors in the buildings have to remain open most of the time, different comfort levels can be set in order to save energy.

What space in the pavilion must be heated and what space can stay non heated?

FORM FACTOR

In 'passive house' energy design the form of the building will greatly influence its energy use and can be calculated with a particular formula called a 'form factor' calculation. While it is unlikely this building will meet the 'passive house' energy standard (as free standing houses rarely do in the Swedish climate), it can still be a useful guide to help reduce energy costs. Therefore the form factor should be considered when designing.

POSSIBLE CONSIDERATIONS FOR THE DESIGN

The following section includes extracted material from the students' work. The considerations presented in this chapter are possible for the design of *Bråtapaviljongen*. They are categorized as possible as they are deemed a bit more advanced then the basic needs for the pavilion, however they could become elements of the final design if the design and budget shows that it is possible or even necessary.

USERS

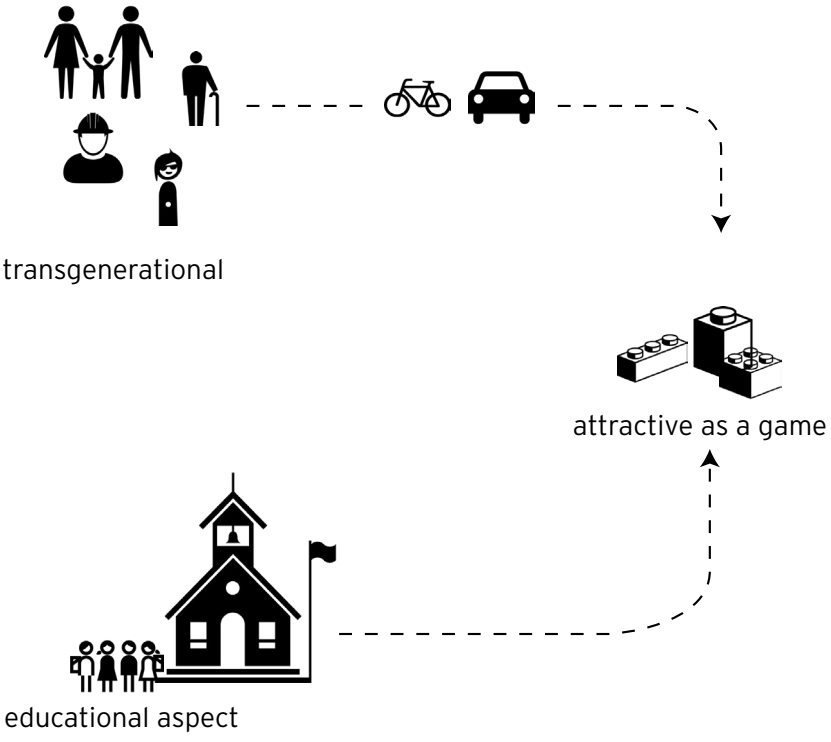
Space for children to learn about reuse and recycling
Group 3: Bråta, the Platform

SCHOOL CHILDREN

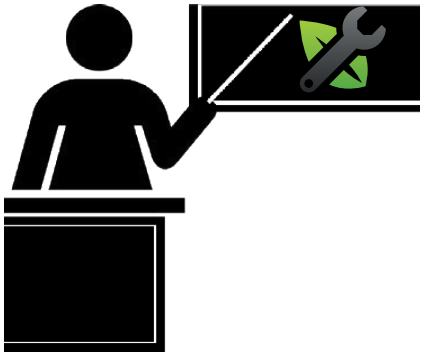
Special events and areas for children could be addressed on the site to help change the view of waste for the next generation. Teaching children has also proven to be an effective way of influencing the parents.

TRANSGENERATIONAL INCLUSION

Different generations could enjoy learning different types of creative and reparation skills that help to reduce the waste of resources at the centre. The centre could also have permanent spaces for creative and game-like activities to occur between different generations.



OUTREACH & INVOLVEMENT



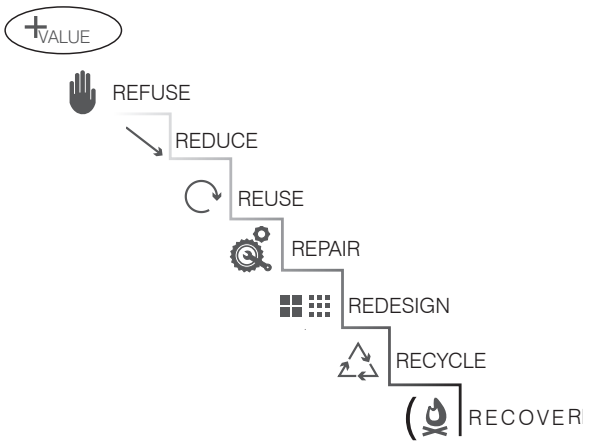
DISTRIBUTING SKILLS

Specialists and artists could be invited to Bråta to give workshops or just give advice to home hobbyists. But hobbyists could also hold their own workshops. The centre could become an exchange of skills in addition to an exchange of materials. Particularly interesting are skill related to converting waste into a resource, such as repair and handicrafts.

A DIGITAL INFORMATION BOARD

A digital information board at the pavilion could provide interactive information about the building and information about reuse and recycling, the waste problem in general, etc. A touch screen could be very effective and easy to use.

Community members could also post things they want to get rid of or need, like a local version of 'freecycle.org'.



Definition of an approach and selection criteria
Group 6: Bråta Resource Park

Including plants in the building and on site can be both aesthetic and functional, as well as help create a sense of place
Group 7: Bråta Product and Resource Park

Earth wall for balanced air humidity
Group 1:What a waste

ASSESSMENT FOR NEW MATERIALS

When creating a building, a responsible approach is to consider the environmental impact it will have and try to make this as low as possible. An regenerative design approach aims to have a positive impact on the surroundings. One aspect of this consideration is the choices of materials, especially when the materials are new. While the pavillion aims to be built with as much material from Bråta as possible, it may become necessary to purchase new materials. In this situation it is good to consider a criteria list for the selection of new materials.

Possible criteria for new materials:

- The products/materials should come from renewable sources

- Materials should not be composites that aren't possible to separate into pure "biological or "technical" content

- Materials should not contain/or have been treated with substances that are toxic for the nature if composted

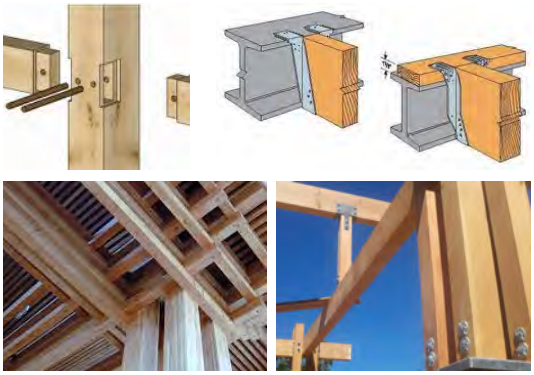
- Materials should not contain/or have been treated with substances that do not allow for recycling in the technical loop

- Materials should help to clean the air

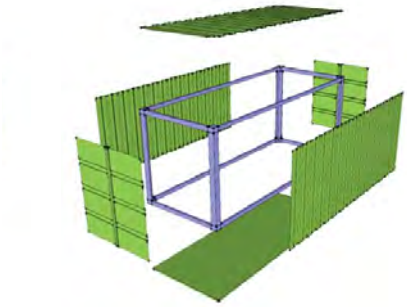
- Materials should help balance the humidity

- Materials should support increased biodiversity

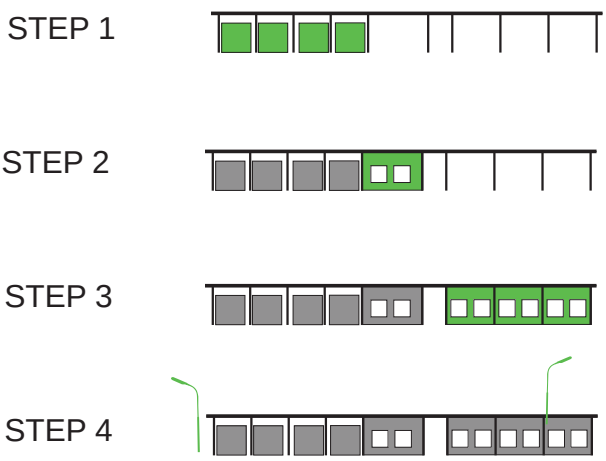
MATERIALS



Easy visible connections
Group 1: What a waste



Extendable structure
Group 2: Bråta recycling centre



Step-by-step
Group 8: Simply a roof

THE LAYERS OF THE BUILDING

To consider the material flow of the building and thereby enable an efficient use of the building for a long time, the different functions of the building can be described and designed as layers. The different functions has different needs and life spans and the construction should support maintenance of these functions without damaging other layers and functions. The lower quality of a material, the more maintenance needed and the easier it should be to reach and maintain the specific element.

Possible considerations:

- There should be possibilities for disassembly within each layer

- The construction should enable service of technical systems in the building

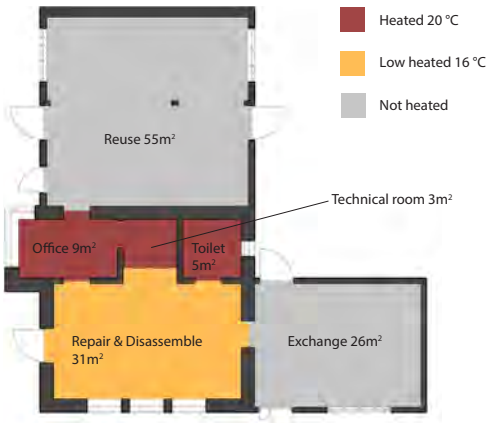
- The construction should enable disassembly with common hand tools.

- The building could be made of modular components

Roof solar panels
Group 9: Bråta Recycling Centre

Compost water heater
Group 9: Bråta Recycling Centre

Earth Wall as a thermal mass wall
Group 2: What a waste



Different levels of indoor comfort
Group 9: Bråta Recycling Centre

HEATING THE BUILDING

Sustainable heating solutions:

- Solar panels (hot water):
Cheap and efficient even when cloudy and in cold weather. Solar panels can be placed on a roof or a vertical surface (group 9).

- Compost water heater (hot water):
Passive system that is cheap and uses food waste. Requires a rather large space for the compost heap (group 9).

- Biomass burning (hot water):
System that uses waste as a heat source. It can be a "stove" or a bio-gas burner. These systems are rather space demanding (stove or boiler, heat exchanger and tanks/storage are needed) (roup 8).

Reducing the amount of heating needed:

- Combine a heating system with a temperature regulation system (e.g. using thermal mass walls or floors). (group 1)

- Pre-heating systems to save energy (group 1, 4).

- Define different levels of comfort depending on activities happening in the different rooms.
(group 9)

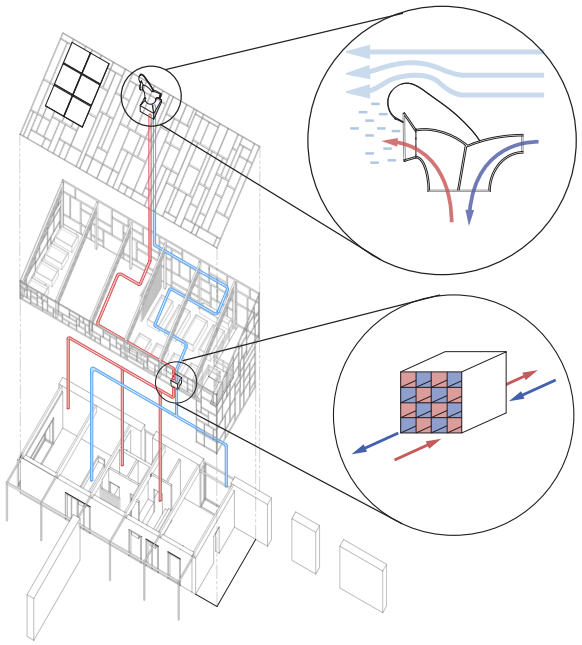
- Combine the heating system with a well insulated and draft free envelope.

VENTILATING THE BUILDING

- Natural ventilation:
Using natural physical principle of convection; colder air coming in low, hot air exiting on top. Natural ventilation requires active human interaction to control and often means opening windows or doors.

- Passive systems:
Passive systems can use natural forces to ventilate the building, for example the wind as shown on the picture on the right (group 6).

- Active systems:
Forced ventilation, or mechanized ventilation uses electricity to pump air in and drive air out. It regulates the air debit in a constant way and can reach optimal ventilation comfort in a building.



Example of passive system using the wind
Group 6: Bråta Resource Park

SAVING ENERGY

The student have often brought strategies to reduce the needs in energy of the future building, solutions that can improve the energy-efficiency of the building but that also can save money.

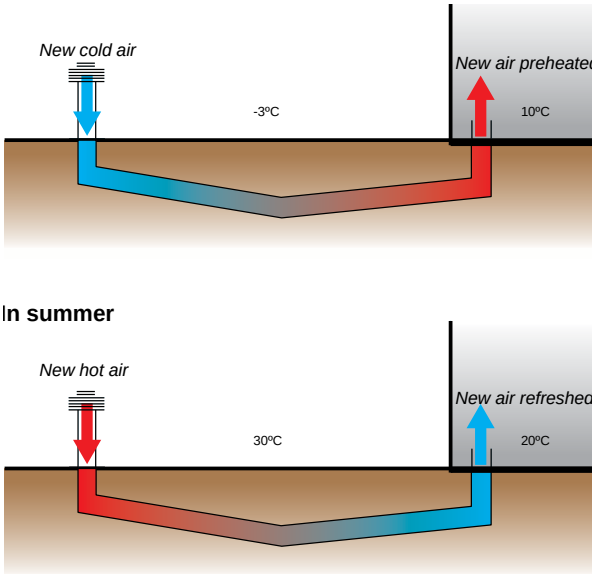
- To use LED lamps (in building and on site) (group 8)

- Providing security to the site with something other than an electric fence.

- Thermal mass (group 1, 9)

- Pre-heating systems (group 1, 4)

- Insulation and air tightness

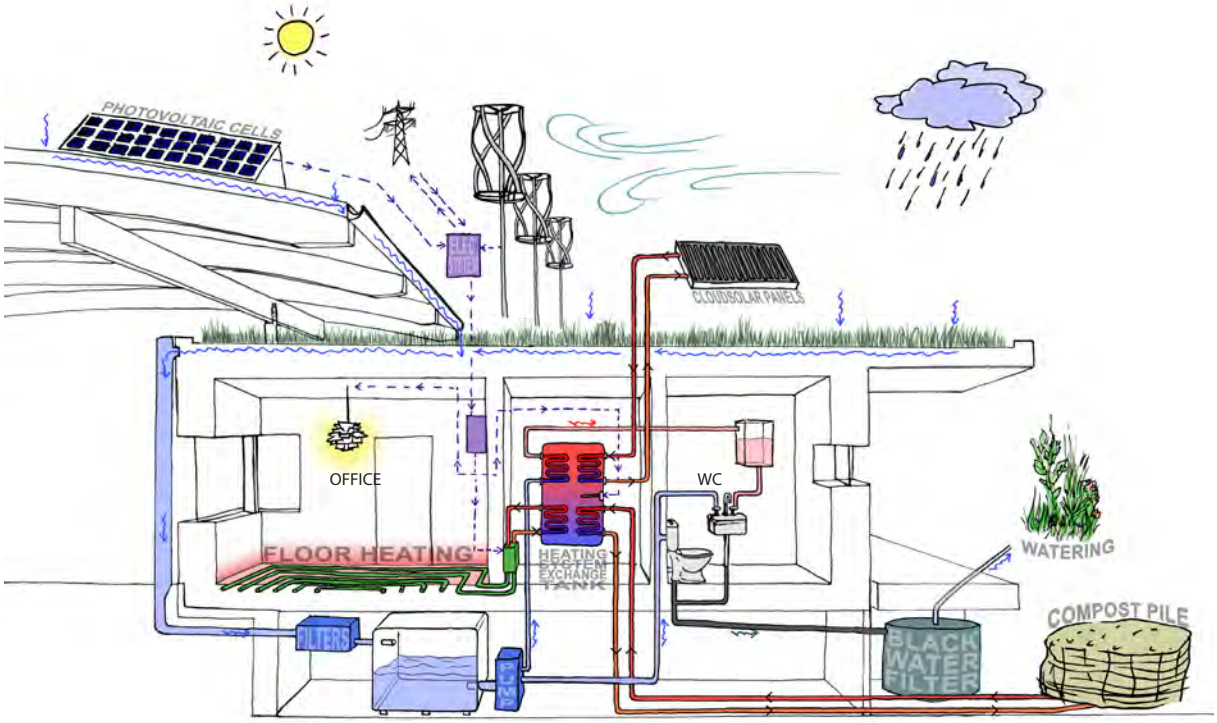


Ground-source pre-heating and cooling system
Group 4: The tree

SYSTEMS-INTEGRATED DESIGN

This is an example of a systems-integrated building. Energy, water, heating, ventilation, lightning systems are inter-connected and thought as loops so that the building is energy and resource efficient.

SYSTEM SECTION



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Systems-integrated design
Group 9: Bråta Recycling Centre

FUTURE CONSIDERATIONS FOR THE DESIGN

The following section includes suggestions extracted from the students' work that are not possible for the present project, but are interesting concepts that suggest progressive ways to take Bråta to the next level in terms of affecting resource use, repositioning the centre's way of relating to the community and creating a memorable and pleasant spatial experience. Future possibilities could, however, affect current design choices and should therefore be considered and discussed.

FUNCTIONS

Second hand shop at Bråta
Group 1: What a waste

SECOND HAND SHOP

Opening a second hand shop at Bråta has often been lifted up by the students. It would accompany the overall vision of promoting sustainable lifestyles, increase the re-use of objects or clothes, develop alternative consumptions of goods, etc. But opening such a shop requires new management strategies, new opening hours, new employees. Therefore it is not possible to envision it for the present project.

Repair and dismantle shop at Bråta
Group 1: What a waste

REPAIR SHOP

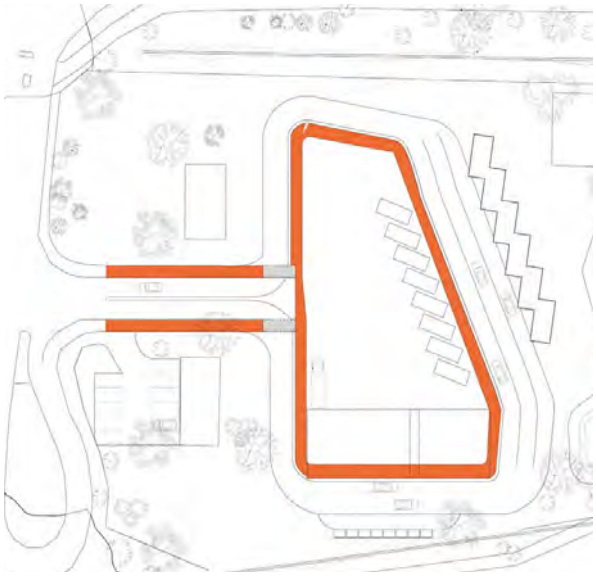
Having the opportunity to repair items on-site represents a great opportunity to take objects that will be donated and fix them oneself. Here people could have space and access to tools and knowledge of how to repair certain things and potentially learn from experts at scheduled workshops. Again, it is coherent to the overall vision to reduce the amount of waste treated at Bråta. But opening a workshop is first costly because of the tools and machineries, it requires staff for safety reasons and a more complex management system for all facilities at Bråta.

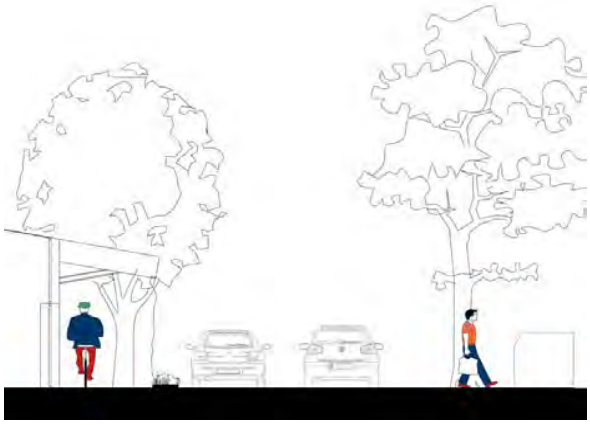
Therefore, it is not possible to envision a workshop for the present project, but is a function that could be, in the coming years, implemented on site.

SITE PLANNING

BICYCLE & PEDESTRIAN INCLUSION

Considering safety for pedestrians and bicycles on site could help increase safety and open up for a wider public use of the site.

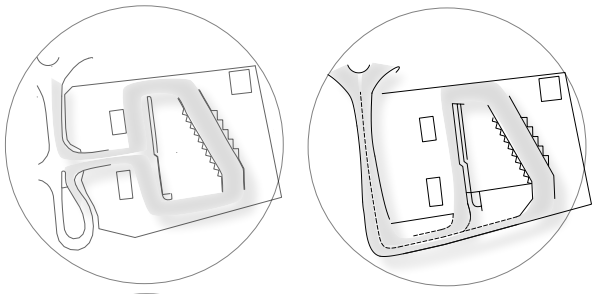




Plan and section of how a bicycle and pedestrian area could look on site
Group 8: Simply a Roof

MOVING THE ENTRANCE AND EXIT

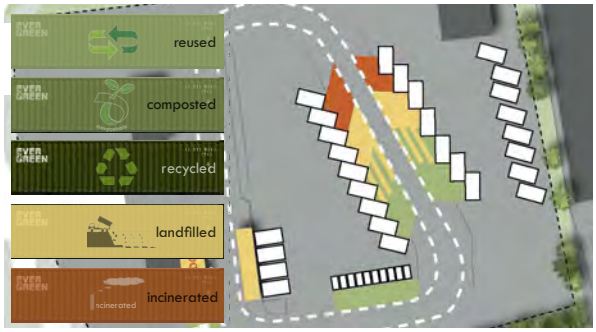
Future improvements of the logistics on site might need a change of the entrance. A number of different projects have suggestions on how the logistics could be improved and more space could be made available on site. This possibility should not be stopped by the new building.



Entrance moved to the south of the site
Group 3: Bråta – The Platform

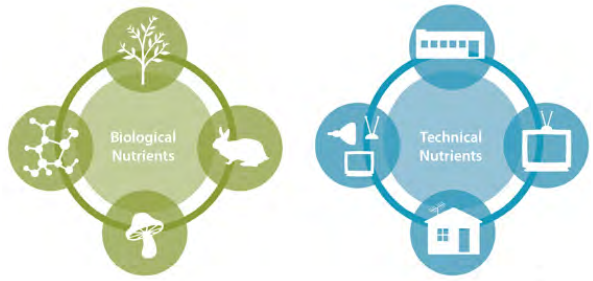
USING COLOUR TO COMMUNICATE AREAS OF THE SITE

The visitors must know where their material goes and therefore a simple signage is important. Colours show the visitors both which container they are looking for, but also what happened with their waste when it leaves Bråta. Colours on pavement, as in the suggestion from Group 7, could be high maintenance, but a similar idea could be used in signage and other information.

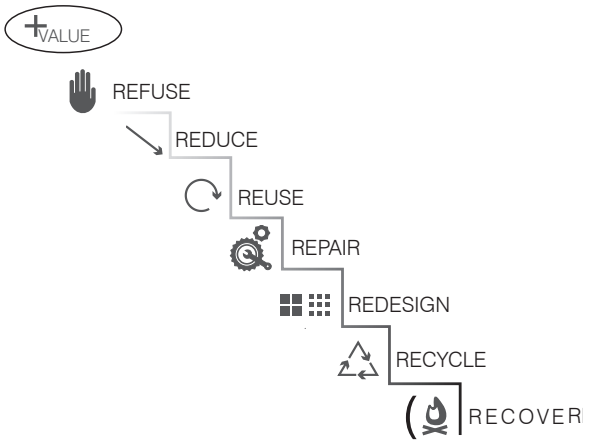


Colours on ground and signage.
Group 7: Bråta Product & Resource Park

SITE PLANNING



The biological and technical loop
Cradle to Cradle
Michael Braungart and William McDonough



An improvement on Lansink's waste ladder
Group 6: Bråta Resource Park

ORGANIZING THE SITE ACCORDING TO A WASTE HIERARCHY & IDEOLOGY

The entire site could be organized according to illustrate principles of recycling and reuse.

BRÅTA AS ECO-PARK

Bråta could become a centre that showcases the full spectra of how we as a society and individuals can reduce our resource use, global footprint and live more harmoniously with the ecosystems that we and other creatures depend upon and are a part of.

CONNECTING TO NATURE AREAS

Very pedagogical approach: Demonstratively connects the act of enjoying nature with the act of recycling and reuse. Ties and reinforces Bråta's relationship to local context and environment.

Repositions Bråta from a periphery activity outside of the community to a centre for activities connecting to large nature areas with hiking paths.

Plans showing how paths from one green area could be connected to another green area along the road outside of Bråta.
Group 4: The Tree

SITE PLANNING

Roof structure covering the containers
Group 3: Bråta – The Platform

ROOF OVER CONTAINERS & THE BULKY WASTE RAMP

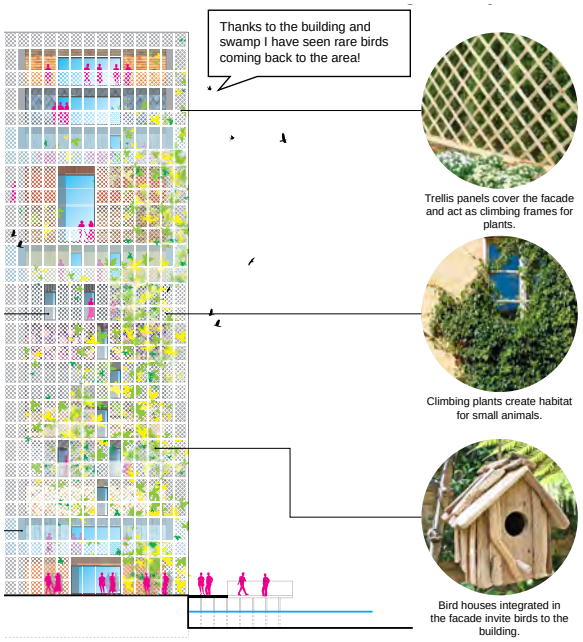
The containers on site could in future be covered by a roof to prevent the water from becoming polluted, the materials from being water damaged and make it easier to come to Bråta on a rainy day.

A green structure creating a holistic experience
Group 5: Bråta

CREATING A HOLISTIC EXPERIENCE

To truly change the identity and experience of Bråta whith a more holistic design of the centre could be considered and implemented as regular repairs and construction is needed on site. A holistic experience will create a harmonious experience and would contribute to a greater 'sense of place' at the centre. Positive feelings associated with the centre would not only come from the functions on site, but also the physical environment itself.

Group 10: Regenerative Recycling Centre Bråta



Metallic trellis façade, habitat for insects and birds.
Group 4: The Tree

INCLUDING ECOSYSTEM SERVICES

The design of a system-integrated building can make the building first resource effective, but can also support other functions such as supporting biodiversity.

Example of supportive solutions:

- Green roofs on site:

Depending on the plant species planted on the roof, birds and insect biodiversity can be improved. Some green roofs do not require maintenance and do not weigh more than a normal roof. Green roofs are also helping cleaning the air that might get polluted on site (Group 5).

- Decreasing paved areas:

Decreasing paved areas decreases the amount of water run off from the site.

- Green walls:

Birds and insects can build their habitats in green walls.

- Bird houses:

Bird houses built out of reused materials can serve as both inspiration and habitat for birds on site.

Indoor production of vegetables and flower
Group 6: Bråta Resource Park

FOOD PRODUCTION

Many groups have integrated the production of food on the site of Bråta. It appears more visionary than realistic for the present, and growing food also means a person taking care of the crops every day.

But in the future, if the recycling centre grows as an inspirational centre for sustainable lifestyles and behaviours, the growing of food could be implemented for educational purposes (to inspire visitors that could ask about growing methods). If a café opens at Bråta, it could be (in a small part) supplied by herbs or vegetables grown on site (in pallets or greenhouse).

SITE PLANNING

Group 5: Bråta

WATER RUN OFF MANAGEMENT:

-Remove as much pavement as possible.

-Add green roofs to all buildings.

-Collect water from roofs
- watering plants
- flushing toilets
- used for washing donated items

-Grey water
- clean through "living machine"
- clean through pond system

-Black water
- separation toilet eliminates black water from toilet
- more elaborate/advanced system

Biolytix

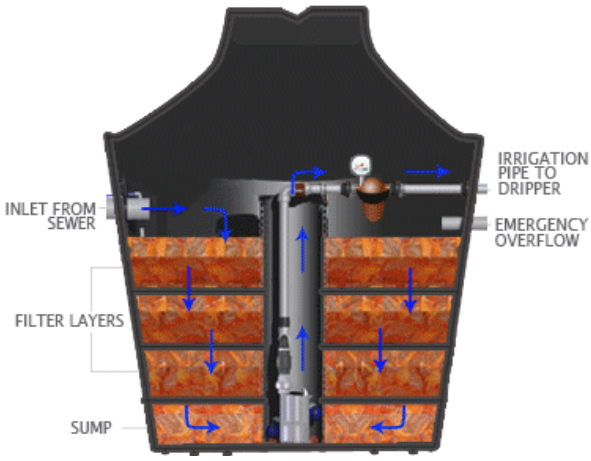
The Biolytix System is a compact waste treatment system that converts raw sewage, wastewater, and food waste into high quality irrigation water on site.

The Biolytix system removes solid wastes from wastewater immediately. Then selected worms, beetles, and microscopic organisms convert the waste into structured humus, which acts as a filter to turn the waste into garden irrigation.

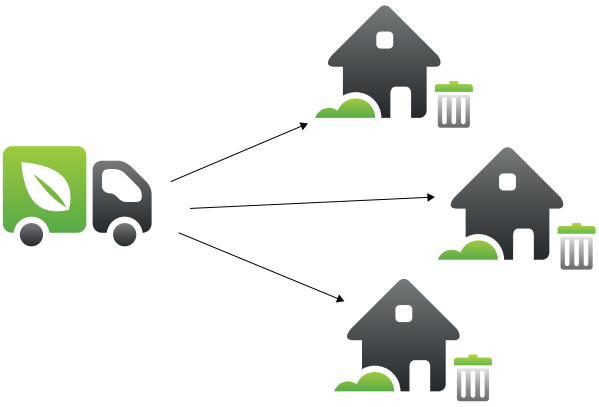
It needs no chemicals and produces irrigation water that is safe for the environment.

A system like this could serve as inspiration for home and summer cottage owners to create systems that convert waste to a re-source in their back yard.

Group 7: Simply a Roof



OUTREACH & INVOLVEMENT



BIO-FUEL AND ELECTRIC TRUCKS

Students suggest that all Bråta vehicles should be run with bio-fuels and electricity produced from renewable sources.

HOME PICK UP SYSTEM

Creating a well advertised internet based system for organizing and ordering a pick up system can help to reduce traffic on site. It could be organized to encourage multiple homes to be serviced at once and the sorting of usable from non-usable items. Assuming these trucks are run with renewable fuels, this will also reduce CO2 emissions.

BICYCLE TRAILERS

Creating a system of rentable or loanable bicycle trailers in town could facilitate access to Bråta for those who do not have cars and would help to create a good image of the centre and its dedication to a sustainable future.

Rentable bicycle trailers is not a new idea
Group 4: The Tree

Group 4: The Tree

BRÅTA APP

Develop a new application for smart-phones could help to spread information and let people get in touch with services from Bråta.

A new sign with incentives and rewards
Group 4: The Tree

GAMES AND REWARDS

Developing ways to encourage the good habits of recycling and reuse could make for a fun and educational experience.

High-efficiency urban wind turbine
Group 5: Bråta

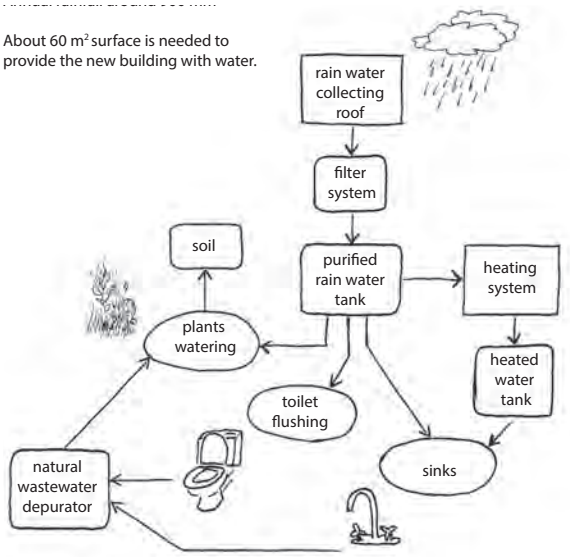
LOCAL ENERGY SUPPLY

The building and site can have local energy supply for electricity using renewable energies: solar or wind power.

• Wind power: Analyses made by the students show that the local conditions are sufficient all year around for using wind energy to produce electricity for the building (group 5). The amount of wind turbines needed is defined by the needs of the building and site in electricity. Wind turbines are a rather expensive technology.

Solar cells
Group 1: What a waste

• Solar power: analyses made by the students show that the local conditions are sufficient from March to August for using solar energy to produce electricity for the building (group 5). Therefore solar power might not be a relevant solution to sustain the building in electricity, but could be an additional source of energy.



Possible integrated water cycle
Group 9: Bråta Recycling Centre

INTEGRATED WATER CYCLE

The building or its surroundings can integrate the possibility to use the rainwater for flushing water, and to clean it locally afterwards.

• Rainwater collection: from the roof; needs to be filtered and stored before used in the building (group 9).

• Local waste water treatment: can be a "waste-water de-purifier" (in the basement of the building for example) but also a series of ponds (more space consuming). Ponds, visible outside the building, can have an educational purpose (group 9). This local treatment makes sense only if the use of water is done in a way that respects environment (use of chemicals, toilet paper, etc.).

REFERENCES

REFERENCES

Sustainable Building Studio

FINAL ASSIGNMENT STUDENT REPORTS

Examiner: Barbara Rubino

(group 1)
Van Weldeen, Coco, Saleryd, Johanna, Abahamsson, Josef & Bianconi, Manon (2014) *What a waste*. Chalmers Arkitektur, Design for Sustainable Development master's program, Sustainable Building Studio.

(group 2)
Alatalo, Erika, Benoit, Camille & Dauvergne, Robin (2014) *Bråta Recycling Centre*. Chalmers Arkitektur, Design for Sustainable Development master's program, Sustainable Building Studio.

(group 3)
Gros, Antonin, Ropel, Carolin and Elif, Ekim (2014) *Bråta, The Platform*. Chalmers Arkitektur, Design for Sustainable Development master's program, Sustainable Building Studio.

(group 4)
Lebreton, Alice, Garcia Moreno, Violeta & Lekander, Victor (2014) *The Tree, a tower in the nature*. Chalmers Arkitektur, Design for Sustainable Development master's program, Sustainable Building Studio.

(group 5)
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(group 6)
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(group 7)
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(group 8)
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(group 9)
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(group 10)
Gismondi, Lorena, Fredriksson, Malin, Reinhardt, Anja (2014) *Regenerative Recycle Centre*. Chalmers Arkitektur, Design for Sustainable Development master's program, Sustainable Building Studio.

ARK465 –Sustainable Building

Elective course - spring 2014- period 3 and 4

Department of Architecture

Week 14 - 22 - Design assignment – Regenerative architecture

Aims

The overall aim of the studio Sustainable Building is to develop successively a regenerative design methodology with inspiration from the Cradle to Cradle approach and from new materials and building technologies. Architectural design aims here at integrating the metabolism of used building materials with the local production of renewable energy, with water purification, with active climate management and with clear intentions for increased biodiversity while implementing environmental sustainability with technological solutions, spatial, aesthetic and experimental aspects in a project. There is no waste, only nutrients and new resources which can be reintroduced in the biological or technological cycles. The design should focus on "circuits of energy, material resources, nature and the relation or differentiation of biological and technical material cycles". Forming a C2C inspired building or element is based on values which are formulated as an intention for a 100% positive goal during a first analysis stage. In order to reach the goals a series of strategies in time are defined in a program. Measurable steps are planned within the traditional stages of the building process (program, briefing, architectural design, tender, construction, management and use, "reuse") which should assume the central values for social, environmental and economic profit. This assignment constitutes the last and final project for the studio Sustainable Building

Assignment:

"Potentialities for regenerative Recycle Centres. Bråta ÅVC: a C2C pavilion and hall for building materials"

General background and scope

Recycling Centres, places where not only objects and materials, but also knowledge and inspiration for reuse can be gathered and distributed, are crucial elements in the creation and function of an urban culture based on regenerative practices of reuse. Recycling centres in Sweden (ÅVCs), in particular ones that focus on separating reusable items from the recyclable and combustible, are a step in the right direction. However, these centres could have a greater impact and be more effectively used by the local inhabitants and the design and construction industries. It is therefore crucial to investigate how the design and placement of ÅVCs can enhance cultural attitudes and activities that support a healthy eco-social system.

ÅVC centres are not often considered as places of social interaction and local identity and the planning of these spaces is often considered an engineering rather than a design problem. This project will begin to identify what social, cultural and community interaction exists and could exist in such a place and which are the physical structures needed to enhance this interaction. It will also begin to map what strategies exist, how they could be further developed or invented for an architectural approach to designing with and for reuse in public spaces.

The assignment

Within the final design assignment students are given a place in an urban context and will work for a real client. The client, the Municipality of Härryda (through engineer Johan Hagman) took contact with Chalmers Architecture, in February 2014, in need of ideas for the future of the Waste Recycle Centre ÅVC in Bråta. "Waste" coming from building transformation activities in the communal area has increased in quantity and changed character. Seeing new potentialities for recycled and reused building materials, the client asks the students of this studio to develop concepts, plans and detailed design for a new local organization and new functional buildings at Bråta, able to protect and select building materials and components, to inform and involve inhabitants and builders about the potentialities of "reuse" and recycle of "waste" coming from buildings and, to create a network of economic entities interested in distributing and selling reused or recycled building materials and elements.

The whole area of Bråta could become a demo for a Recycle Center of the future. The following functions have been discussed:

- A "hall" collecting building materials and elements, textiles, furniture, domestic appliances, etc (not heated)
- A smaller Cradle to Cradle "pavilion". Info-centre for meeting the public and for exhibitions, maybe used only on weekends or for meetings (heated when needed)
- A smaller office for a "host" able to assist visitors in the sorting of materials and identifying what can be reused rather than recycled (good interior climate)
- Ideas for the whole area with surroundings

There are different definitions of the problems that shall be solved. The studio project aims at inspiring the client with new definitions and local physical solutions.

Content

Phase 1: Research and concept

The design assignment will be developed in **teamwork of 3 or max 4 students (new groups),** where the focus is on investigations about how human buildings can be integrated with nature and natural processes. This includes the set of addressed C2C parameters, and the possible approaches to develop a design method based on reused and recycled materials in the buildings that shall be built.

The teams shall develop and present clear intentions, an own strategy and local concept in the form of an **overall plan** for the area of Bråta (the larger system).

In this phase each group must submit:

- An account of programs and experiential qualities they envision for the area, how these interact internally within the recycle central and with the surrounding city and region.
- A list of which green tools, Cradle to Cradle elements and technologies will develop the plan and how they correspond to the program and the intentions of the projects.
- Own choice of visualizations, diagrams, conceptual models and section-drawings.

This team-specific C2C declaration and program will serve as a basis to guide the teams' design proposal.

Phase 2: Program and Performance
The groups develop an area and/or a building from the overall plans discussed in phase 1 (define the borders of the system you will work with) and present ideas focusing not so much on design but on the themes: **Energy – Nature – Materials** or a combination of them, with emphasis on Performance.

How does this local program perform in the social, spacial, material and productive cycle it is part of? Edifices that produce more energy than they consume; areas that also perform as water cleaning and material production; facilities with integration of reused, new and experimental materials and technologies; information and demonstration of intents for the public; a social-ecological place; etc

Deliveries phase 2:
- Model (digital and/or physical) of the area with sketch models.
- Diagrams and conceptual plans and sections;
- Definition of the building system's performance and correspondence to the overall plan and to the environment, explained through the themes of **Energy, Nature and/or Materials**.

Phase 3: Architectural design and detailing
Teams finish the projects to a convincing and coherent architectural proposal **exposed in efficient presentation material according to size, complexity and emphasis of each project, decided between students and tutors**.

Final presentation: The final presentation and critics will focus on the results of phase 3.

Learning outcomes

Knowledge and Understanding
On completion of the studio the student shall demonstrate:

- knowledge about the basic principles of Cradle to Cradle
- understanding of the different implications of biomimetic design for sustainable architecture
- broad understanding of various and diverse approaches to resource efficiency

Skills and ability:

At the end of the studio the student shall demonstrate the **ability to**:
- combine design with investigation
- develop and present performative principles in architectural design

At the end of the studio the student shall **demonstrate**:
- **competencies** in integrating holistic environmental considerations with design work and argumentation
- **skills and competencies** in reflective writing on the inputs, issues and themes of the studio and of the own work
- **competencies** in deploying Cradle to Cradle and other appropriate environmental principles in architectural design
- **skills** in using a diverse range of tools and strategies in order to promote the design of integrated systems for healthy indoor climate and resource efficiency on a larger scale.
- **Skills** in designing and promoting regenerative architecture

Assessment criteria

The group work will be assessed group wise while the writing of the "article" is individual. The design work will be assessed according to the degree of fulfillment of the learning outcomes described above. The production of the studio will be assessed as a whole, the design work counts for the 80% and the writing of the article will count for 20%.

Schedule

Step 1	Build groups (3 or max. 4 persons)
Phase 1	**Research and concept** from 31/3 to 11/4
Phase 2	**Program and Performance** from 22/4 to 5/5(presentation 2)
Phase 3	**Architectural design and detailing** from 5/5 to 21/5 (delivery)
Step 2	Deliver the digital files of the final design proposal on Pinpong, "Projektgrupper: DESIGN ASSIGNMENT> regenerative design
Step 3	print the groups' final design on A1 posters for the exhibition in the A-entry hall (give the printed posters to the exhibition work-group that will take care of the exhibition and organize the event)
Step 4	Prepare an oral presentation of your project of about 20 min with slides.
	State clearly the names of the group members that have contributed to the design proposal
Final presentation	**Friday 23/5**

***OBS!** The design and research process in each team must be noted in a "**Log-book**" preferably day by day. Sigrid will have a short presentation about what and how it should be done on Monday 31/3 before noon.*


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